

Vig770S Motherboard Manual

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Viglen, EMC and the 'CE' mark

CE Marking

European standards are being harmonised across borders. If products comply with the same standards in all European countries, product exporting and importing is made simple - paving our way to a common market. If you buy a product with a 'CE' mark on it (shown below), on the box, in the manual, or on the guarantee - it complies with the currently enforced directive(s).



Introduction to EMC

EMC (Electromagnetic Compatibility) is the term used to describe certain issues with RF (Radio Frequency) energy. Electrical items should not interfere with each other through RF emissions. E.g. If you turn on your microwave, your television should not display interference if both items are CE marked to the EMC directive.

If emitted RF energy is not low, it can interfere with other electrical circuitry - E.g. cars automatic braking systems have become activated by themselves while in a strong RF field. As this has, obvious repercussions ALL electrical products likely to cause RF related problems have to be 'CE' marked from 1st January 1996 onwards.

If a product conforms to the EMC directive, not only should its RF emissions be very low, but also its immunity to RF energy (and other types) should be high. The apparatus has to resist many 'real world' phenomena such as static shocks and mains voltage transients.

Viglen's Environment laboratory

To gain a 'CE' mark, the Viglen computer range has had to undergo many difficult tests to ensure it is Electromagnetically Compatible. These are carried out in the in-house 'Environment lab' at Viglen Headquarters. We have made every effort to guarantee that each computer leaving our factory complies fully with the correct standards. To ensure the computer system maintains compliance throughout its functional life, it is essential you follow these guidelines.

- Install the system according to Viglen's instructions
- If you open up your Viglen:
- Keep internal cabling in place as supplied.
- Ensure the lid is tightly secured afterwards
- Do not remove drive bay shields unless installing a 'CE' marked peripheral in its place
- The clips or 'bumps' around the lips of the case increase conductivity - do not remove or damage.
- Do not remove the ferrite ring from the L.E.D cables.
- Only use your Viglen computer with 'CE' marked peripherals

This system has undergone testing in accordance with European standards for use in residential and light industrial areas-this specifies a 10-meter testing radius for emissions and immunity. If you do experience any adverse effects, which you think is due to your computer, try moving it at least 10 meters away from the affected item. If you still experience problems, contact Viglen's Technical Support department who will put you straight through to an EMC engineer - s/he will do everything possible to help. Any modifications made to your Viglen computer system, it might breach EMC regulations. XMA take no responsibility (about EMC characteristics) of equipment that has been altered or modified.



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Chapter 1 Motherboard Overview

1.1 Introduction

This manual describes the Viglen Vig770S motherboard inside your computer. The motherboard is the most important part of your computer. It contains the CPU, memory and graphics circuitry that make the computer work in the correct manner.

The Vig770S motherboard is an ATX form factor-offering legacy to premium features. PS/2 mouse/keyboard combo port, integrated Graphics via VGA, DVI, DisplayPort and HDMI, High Definition Audio via 3 flexible audio jacks and integrated 10/100/1000 network connection, as well as 2 USB 2.0 and 4 USB 3.0 ports to enrich your multimedia creation experience.

The Vig770S Motherboard supports 7th generation Intel Core i3, i5, and i7 processors, and is backward compatible with 6th generation Intel Core i3, i5, and i7 processors as well as being Microsoft Windows 7, 8.1 and Windows 10 WHQL certified.

This manual contains technical information about the Viglen Vig770S motherboard and other hardware components inside your computer. If you are new to computers, we recommend that you read the user guide first. If you are an experienced computer user, this manual should provide all the information you will need to perform simple upgrades and maintenance.

We hope that this manual is both readable and informative. If you have any comments for suggestions about how we could improve the format, then please fill out the form at the back of the manual and send it to us.

Above all, we hope that you enjoy using your Viglen computer.

Chapter 2 Motherboard

2.1 Feature Summary

2.1.1 Form factor:

- **MicroATX** Form Factor 9.6 x 9.6 in (244 x 244 mm).

2.1.2 Processor:

- Intel® for 7th Generation Core™ i7/Core™ i5/Core™ i3/Pentium®/Celeron® Processors
- Intel® for 6th Generation Core™ i7/Core™ i5/Core™ i3/Pentium®/Celeron® Processors
- Supports Intel® 14 nm CPU
- Supports Intel® Turbo Boost Technology 2.0
- The Intel® Turbo Boost Technology 2.0 support depends on the CPU types.

2.1.3 Chipset

- Intel® B250 Chipset

2.1.4 Memory

- 4x DIMM, Max. 64GB, DDR4 2400/2133 MHz Non-ECC, Un-buffered Memory

2.1.5 Graphics

- Integrated Graphics Processor- Intel® HD Graphics support
- Multi-VGA output support: HDMI/DVI-D/RGB ports
 - Supports HDMI with max. resolution 4096 x 2160 @ 24 Hz / 2560 x 1600 @ 60 Hz
 - Supports DVI-D with max. resolution 1920 x 1200 @ 60 Hz
 - Supports DisplayPort with max. resolution 4096 x 2304 @ 60 Hz
 - Supports RGB with max. resolution 1920 x 1200 @ 60 Hz
- Maximum shared memory of 1024 MB
- Supports Intel® InTru™ 3D, Quick Sync Video, Clear Video HD Technology, Insider™
- Supports up to 3 displays simultaneously

2.1.6 Audio

- Realtek® ALC887 8-Channel High Definition Audio CODEC *1
- Supports: Jack-detection, Front Panel Jack-re-tasking

2.1.7 LAN

- Intel® 1219LM 1 x Gigabit LAN Controller(s)

2.1.8 SATA

- 6 x SATA 6Gb/s connector(s)
Internal Connectors
- 1 x USB 3.0 connector(s) support(s) additional 4 USB 3.0 port(s)
- 2 x USB 2.0 connector(s) support(s) additional 2 USB 2.0 port(s)
- 2 x COM port(s) connector(s)
- 6 x SATA 6Gb/s connector(s)
- 1 x CPU Fan connector(s) (1 x 4 -pin)
- 2 x Chassis Fan connector(s) (1 x 4 -pin)
- 1 x 24-pin EATX Power connector(s)
- 1 x 8-pin ATX 12V Power connector(s)
- 1 x Front panel audio connector(s) (AAFP)
- 1 x Internal speaker connector(s)
- 1 x System panel(s)
- 1 x Clear CMOS jumper(s)

2.1.9 Expansion Capabilities

- 1 x PCI Express 3.0/2.0 x16

2.1.10 Rear I/O Ports

- 1 x PS/2 keyboard/mouse combo port(s)
- 1 x DVI-D
- 1 x Display port
- 1 x D-Sub
- 1 x HDMI
- 1 x LAN (RJ45) port(s)
- 4 x USB 3.0 (blue)
- 2 x USB 2.0
- 3 x Audio jack(s)

2.2 System Board Connectors

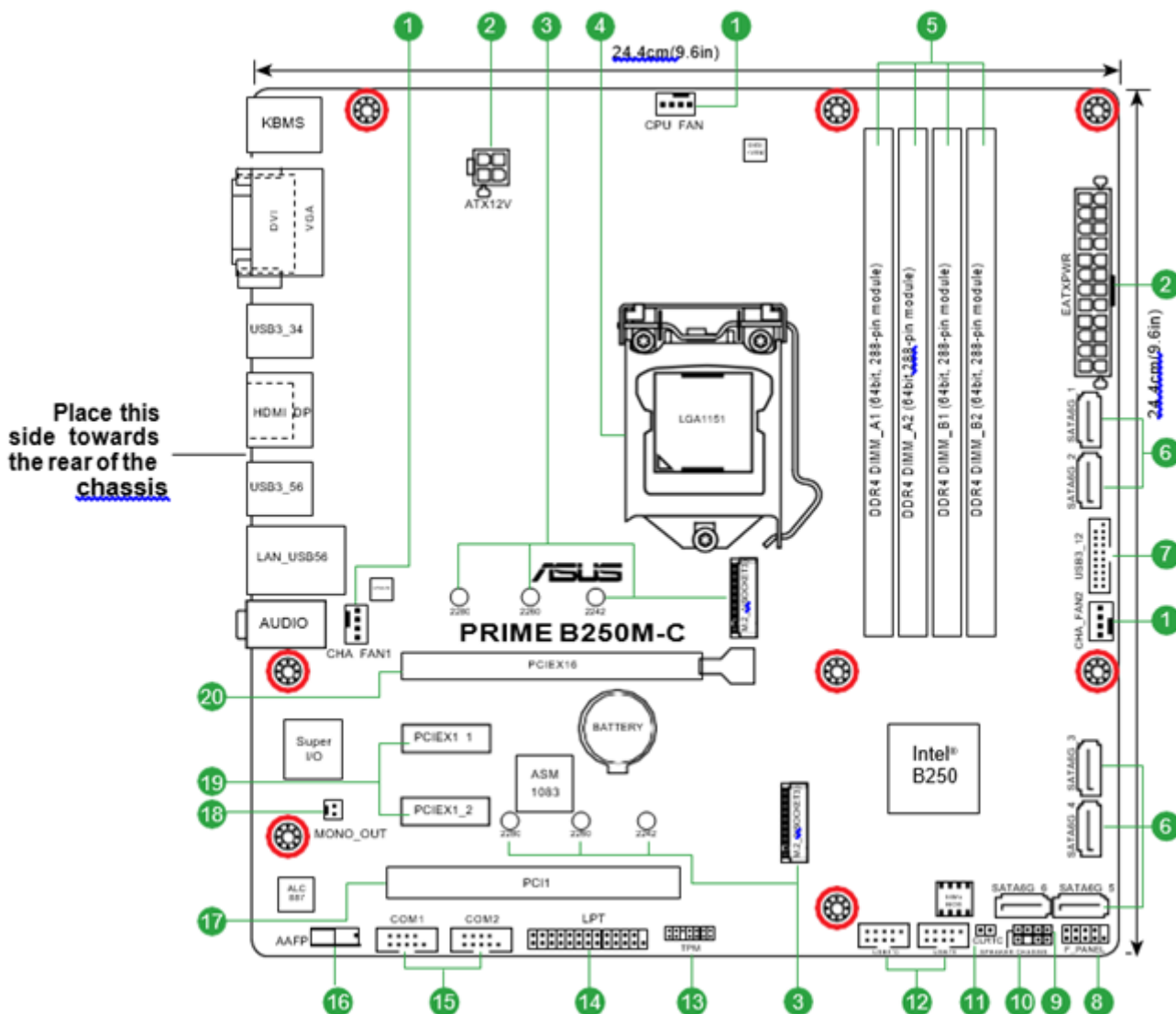


Figure 1: System Board Components

1	CPU and chassis fan connectors (4-pin CPU_FAN, 4-pin CHA_FAN1/2)	9	Speaker connector (4-pin SPEAKER)
2	ATX power connectors (24-pin EATXPWR, 8-pin ATX12V)	10	Chassis intrusion header (4-1 pin CHASSIS)
3	M.2 socket 3	11	Clear RTC RAM (2-pin CLRTC)
4	Intel® LGA1151 CPU socket	12	USB 2.0 connector (10-1 pin USB78)
5	DDR4 DIMM slots	13	TPM Connector
6	Intel® B250 Serial ATA 6.0Gb/s connectors (7-pin SATA6G_1~6)	14	LPT connector (26-1 pin LPT)
7	USB 3.0 connectors (20-1 pin USB3_12, USB3_910)	15	Serial port connectors (10-1 pin COM)
8	System panel connector (10-1 pin F_PANEL)	16	Front panel audio connector (10-1 pin AAFP)
17	PCI slot	18	Mono out header (2-pin MONO_OUT)
19	PCI Express 3.0/2.0 x1 slots	20	PCI Express 3.0/2.0 x16 slot

Table 1: System Board Components

2.2.1 (1) CPU and chassis fan connectors (4-pin CPU_FAN, 4-pin CHA_FAN).

Connect the fan cables to the fan connectors on the motherboard, ensuring that the black wire of each cable matches the ground pin of the connector.

NOTE: Do not forget to connect the fan cables to the fan connectors. Insufficient airflow inside the system may damage the motherboard components. These are not jumpers! Do not place jumper caps on the fan connectors! The CPU_FAN connector supports a CPU fan of maximum 1A (12 W) fan power.

2.2.2 (2) ATX power connectors (24-pin EATXPWR, 4-pin ATX12V)

Correctly orient the ATX power supply plugs into these connectors and push down firmly until the connectors completely fit.

NOTE: For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 350 W.

2.2.3 (3) M.2 socket 3

These sockets allow you to install an M.2 (NGFF) SSD module.

2.2.4 (4) Intel® LGA1151 CPU socket

Install Intel® LGA1151 CPU into this surface mount LGA1151 socket, which is designed for sixth Generation Intel® Core™ i7 / i5 / i3, Pentium®, and Celeron® processors.

2.2.5 (5) DDR4 DIMM slots

This motherboard comes with four Double Data Rate 4 (DDR4) Dual Inline Memory Module (DIMM) sockets. A DDR4 module is notched different from a DDR, DDR2, or DDR3 module. Install 2 GB, 4 GB, 8 GB, and 16 GB un-buffered non-ECC DDR4 DIMMs into these DIMM sockets.

2.2.6 (6) Intel® B250 Serial ATA 6.0 Gb/s connectors (7-pin SATA6G 1~6).

These connectors connect to Serial ATA 6.0 Gb/s hard disk drives via Serial ATA 6.0 Gb/s signal cables

2.2.7 (7) USB 3.0 connector (20-1 pin USB3_12 USB3 910)

Connect a USB 3.0 module to any of these connectors for additional USB 3.0 front or rear panel ports. These connectors comply with USB 3.0 specifications and provide faster data transfer speeds of up to 5Gbps, faster charging time for USB-chargeable devices, optimized power efficiency, and backward compatibility with USB 2.0.

2.2.8 (8) System panel connector (10-1 pin Front Panel)

This connector supports several chassis-mounted functions.

2.2.9 (9) Speaker connector (4-1 pin SPEAKER)

The 4-pin connector is for the chassis-mounted system-warning speaker. The speaker allows you to hear system warnings.

2.2.10 (10) Chassis intrusion header (4-1 pin CHASSIS)

This header is for a chassis-mounted intrusion detection sensor or switch. Connect one end of the chassis intrusion sensor or switch cable to this connector. The chassis intrusion sensor or switch sends a high-level signal to this connector when chassis components, are removed or replaced. The signal is, generated as a chassis intrusion event.

2.2.11 (11) Clear RTC RAM (2-pin CLRTC)

This header allows you to dis-configure ME and clear the CMOS RTC RAM data of the system setup information such as date, time, and system passwords.

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Use a metal object such as a screwdriver to short the two pins.
3. Plug the power cord and turn ON the computer.
4. Hold down the key during the boot process and enter BIOS setup to re-enter data.

NB: If the steps above do not help, remove the on-board battery and short the two pins again to clear the CMOS RTC RAM data. After clearing the CMOS, reinstall the battery.

2.2.12 (12) USB 2.0 connector (10-1 pin USB78)

Connect the USB module cable to this connector; install the module to a slot opening at the back of the system chassis. This USB connector complies with USB 2.0 specifications and supports up to 480Mbps connection speed.

2.2.13 (13) TPM Connector

This header allows you to connect a Trusted Platform module.

2.2.1 (14) LPT connector (26-1 pin LPT)

The LPT (Line Printing Terminal) connector supports devices such as a printer. LPT standardizes as IEEE 1284, which is the parallel port interface on IBM PC-compatible computers.

2.2.1 (15) Serial port connectors (10-1 pin COM)

Connect the serial port module cable to these connectors, and then install the module to a slot opening at the back of the system chassis.

2.2.1 (16) Front panel audio connector (10-1 pin AAFP)

This connector is for a chassis-mounted front panel audio I/O module that supports HD Audio standard. Connect one end of the front panel audio I/O module cable to this connector.

NB: We recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high-definition audio capability.

2.2.1 (17) PCI slot.

The PCI slot supports cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI specifications.

2.2.1 (18) Mono out header (2-pin MONO_OUT)

This internal mono out header allows connection to an internal, low power speaker for basic system sound capability. The subsystem is capable of driving a speaker load of 2 Ohms at 2 Watts (rms).

2.2.1 (19) PCI Express 3.0/2.0 x1 slots

This motherboard supports two PCI Express x1 network cards, SCSI cards, and other cards that comply with the PCI Express specifications.

2.2.1 (20) PCI Express 3.0/2.0 x16 slot

This motherboard has a PCI Express 3.0/2.0 x16 slot that supports PCI Express 3.0/2.0 x16 graphic cards complying with the PCI Express specifications.

IRQ assignments for this motherboard

When using PCI cards on shared slots, ensure that the drivers support “Share IRQ” or that the cards do not need IRQ assignments. Otherwise, conflicts will arise between the two PCI groups, making the system unstable and the card inoperable.

	A	B	C	D
HD Audio	Shared	-	-	-
XHCI Controller	Shared	-	-	-
SATA Controller	Shared	-	-	-
LAN1 I219LM	Shared	-	-	-
PCIEx16	Shared	-	-	-
PCIEx1 1	-	-	Shared	-
PCIEx1 2	-	-	-	Shared
PCI1	-	Shared	-	-
M.2_1	Shared	-	-	-
M.2_2	Shared	-	-	-

2.3 Rear panel connectors

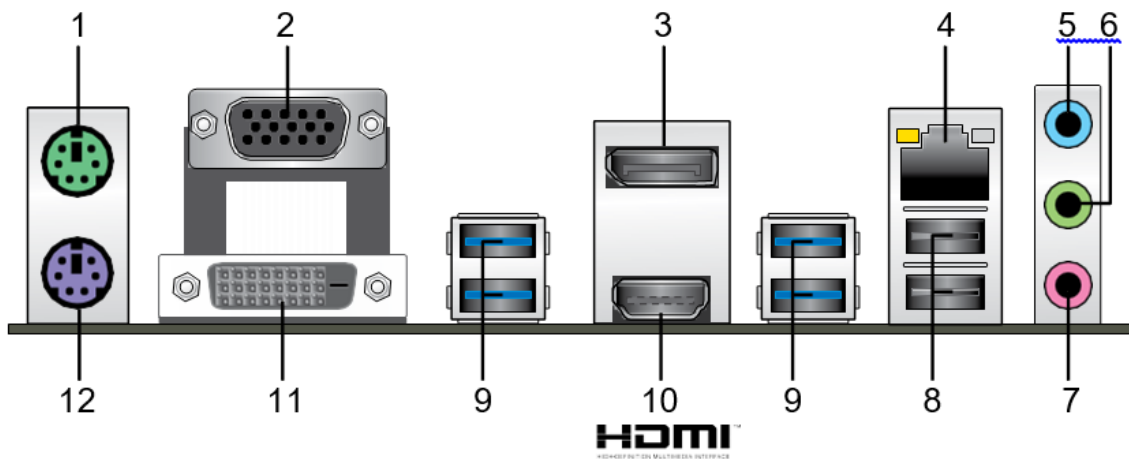


Figure 2: Rear panel connectors

1	PS/2 mouse port (green).	7	Microphone port (pink)
2	Video Graphics Adapter (VGA) port.	8	USB 2.0 ports
3	Display port	9	USB 3.0 ports
4	LAN (RJ-45) port.	10	HDMI port.
5	Line In port (light blue).	11	DVI-D port
6	Line Out port (lime).	12	PS/2 keyboard port (purple).

Table 3: Rear panel connectors

2.2.1 (1) PS/2 mouse port (green)

This port is for a PS/2 mouse.

2.2.2 (2) Video Graphics Adapter (VGA) port.

This 15-pin port is for a VGA monitor or other VGA-compatible devices

2.2.3 (3) Display Port

This port is for display compatible devices

2.2.4 (4) LAN (RJ-45) port.

LAN (RJ-45) port. This port allows Gigabit connection to a Local Area Network (LAN) through a network hub.

LAN port LED indications

Activity/Link LED		Speed LED	
Status	Description	Status	Description
Off	No link	OFF	10Mbps connection
Orange	Linked	ORANGE	100Mbps connection
Orange (Blinking)	Data activity	GREEN	1Gbps connection
Orange (Blinking then steady)	Ready to wake up from S5 mode	–	–

2.2.5 (5) Line in port (light blue).

This port connects to the tape, CD, DVD player, or other audio sources.

2.2.6 (6) Line Out port (lime).

This port connects to a headphone or a speaker. In the 4.1, 5.1 and 7.1-channel configurations, the function of this port becomes Front Speaker Out.

2.2.7 (7) Microphone port (pink).

This port connects to a microphone.

Refer to the audio configuration table for the function of the audio ports in 2.1, 4.1, 5.1, or 7.1-channel configuration.

Audio 2.1, 4.1, 5.1, or 7.1-channel configuration				
Port	Headset 2.1-channel	4.1-channel	5.1-channel	7.1-channel
Light Blue (Rear panel)	Line In	Rear Speaker Out	Rear Speaker Out	Rear Speaker Out
Lime (Rear panel)	Line Out	Front Speaker Out	Front Speaker Out	Front Speaker Out
Pink (Rear panel)	Mic In	Mic In	Bass/Center	Bass/Center
Lime (Front panel)	-	-	-	Side Speaker

To configure a 7.1-channel audio output:

Use a chassis with HD audio module in the front panel to support a 7.1-channel audio output.

2.2.8 (8) USB 2.0 ports.

These 4-pin Universal Serial Bus (USB) ports are for USB 2.0, 1.1 devices.

2.2.9 (9) USB 3.0 ports.

These 9-pin Universal Serial Bus (USB) ports are for USB 3.0, 2.0 devices.

NB:

- USB 3.0 devices used for data storage.
- We strongly recommend that you connect USB 3.0 devices to USB 3.0 ports for faster and better performance from your USB 3.0 devices.
- Due to the design of the Intel® 200 series chipset, the xHCI controller controls all USB devices connected to the USB 2.0 and USB 3.0 ports. Some legacy USB devices must update their firmware for better compatibility.

2.2.10 (10) HDMI port.

This port is for a High-Definition Multimedia Interface (HDMI) connector, and is HDCP compliant allowing playback of HD DVD, Blu-Ray, and other protected content.

2.2.11 (11) DVI-D port.

This port is for any DVI-D compatible device.

NB: DVI-D cannot be converted to output from RGB Signal to CRT and is not compatible with DVI-I.

2.2.12 (12) PS/2 keyboard port (purple).

This port is for a PS/2 keyboard.

Chapter 3 – System Board Options

3.1 Upgrades

The Vig770s motherboard supports Intel® Core i3, i5, i7 and Pentium processors in the LGA1151 socket. RAM support up to a maximum of 64GB using DDR4 2400/2133MHz Non ECC Un-buffered DIMMs.

WARNING!

Unplug the system before carrying out the procedures described in this chapter. Failure to disconnect power before you open the system can result in personal injury or equipment damage. Hazardous voltage, current, and energy levels are present in this product. Power switch terminals can have hazardous Voltages present even when the power switch is off.

The procedures assume familiarity with the general terminology associated with personal computers and with the safety practices and regulatory compliance required for using and modifying electronic equipment.

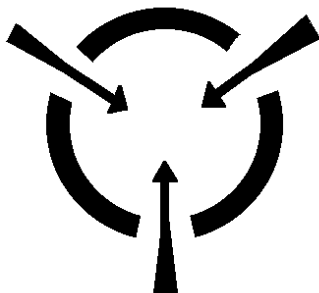
Do not operate the system with the cover removed. Always replace the cover before turning on the system.

As the colours of the wires in the mains, lead of this computer may not correspond with the coloured markings identifying the terminals in your plug precede as follows:

The green-and-yellow wire must connect to the **terminal**. in the plug, which is marked by the letter **E** or by the safety Earth symbol **Q** or coloured green or **green- and-yellow**.

The wire, which is coloured blue, connects to the terminal, which is marked with the letter **N** or coloured **black**.

The wire, which is coloured brown, connects to the terminal, which is marked with the letter **L** or coloured **red**.



CAUTION!

The Viglen Vig770S motherboard and associated components are sensitive electronic devices. A small static shock from your body can cause expensive damage to your equipment.

Make sure you are earthed and free of static charge before you open the computer case. If you are unsure about upgrading your computer, return it to Viglen so a qualified engineer can perform the upgrade.

Steps to take to prevent static discharge:

The best way to prevent static discharge is to buy an anti-static strap from your local electrical shop. While you are wearing the strap and is grounded. Static charge will be harmlessly when grounded.

Do not remove the component from its anti-static protective packaging until you are about to install it.

Hold boards by the edges - try not to touch components / interface strips etc.

NOTE: We recommend that you return your computer to the service department for upgrading. Person who is familiar with handling should only carry out upgrades. As incorrect installation will invalidate the guarantee.

3.2 Upgrading the CPU

CAUTION!

Before installing or removing a processor, make sure the AC power is disconnected. By unplugging the power, cord from the computer the standby power LED should not light up. Failure to do so could damage the processor and the board. To install a processor, follow these instructions:

Unlatch the processor socket lever by pushing it down and away from the socket.

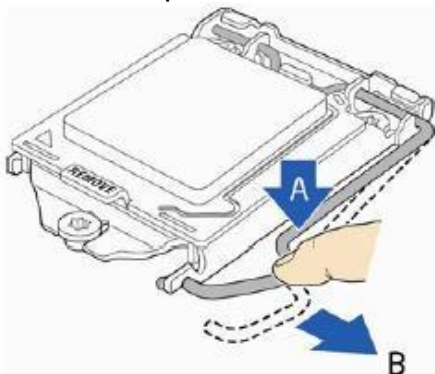


Figure 4: Unlatch the socket lever

Rotate the socket lever to lift the load plate away from the socket (Figure 5, A). Make sure that the load plate is in the fully open position (Figure 5, B) while being careful not to damage adjacent components. Do not touch the socket contacts.

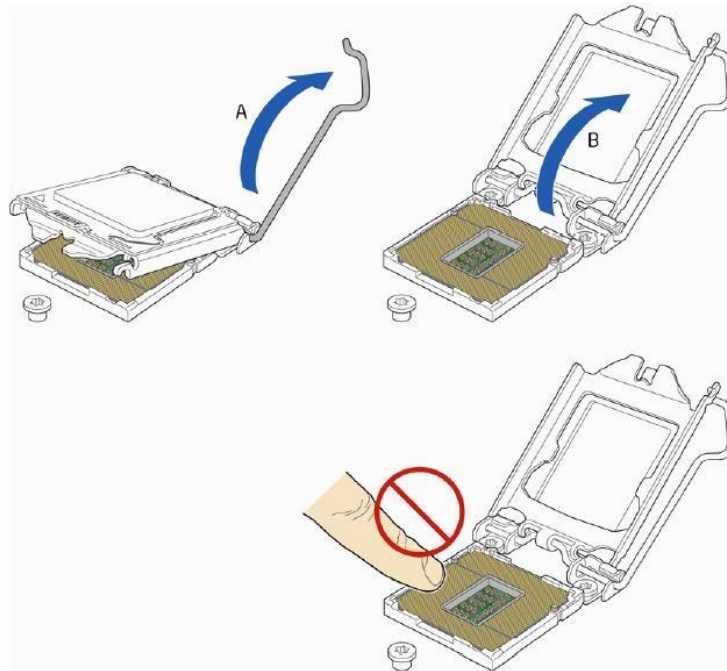


Figure 5: Lift the load plate

Remove the processor from its protective cover. Hold the processor only at the edges, being careful not to touch the bottom of the processor (see Figure 6).

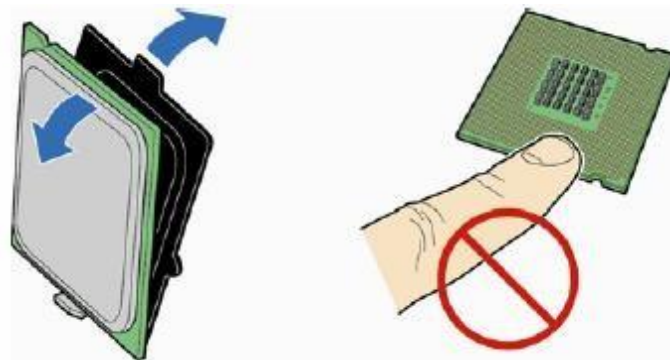


Figure 6: Remove the processor from the protective cover Remove the processor from the protective cover

Note: Do not discard the processor cover. Always replace the processor cover if you remove the processor from the socket.

Hold the processor with your thumb and index finger oriented as shown in Figure 7 to align your fingers with the socket finger cuts. Make sure that the processor Pin 1 indicator (gold triangle) is aligned with the pin 1 chamfer on the socket (Figure 7, B) and that the notches on the processor align with the posts on the socket (Figure 7, C). Lower the processor straight down without tilting or sliding it in the socket (Figure 7, A).

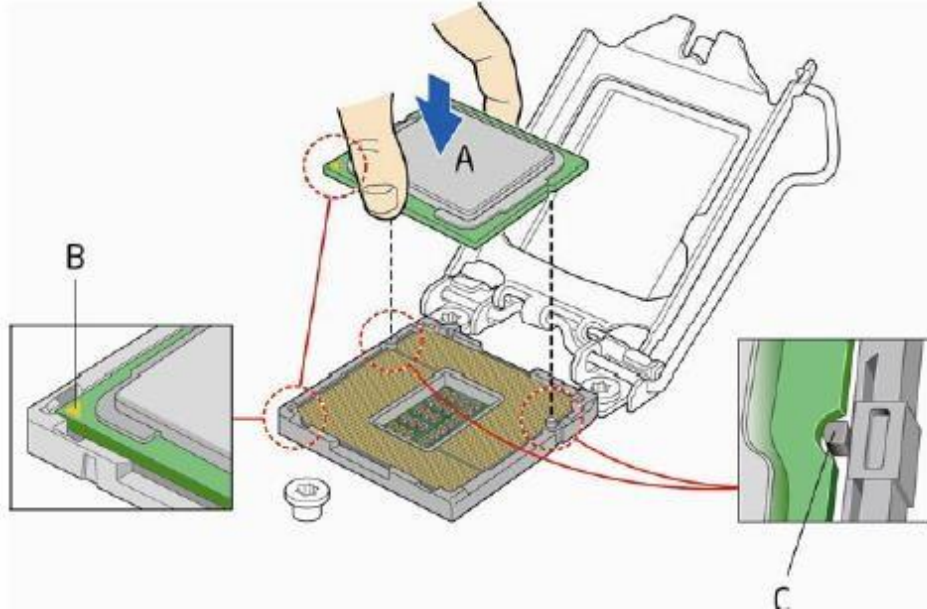


Figure 7: Install the processor

Carefully lower, the socket lever (figure 8), while making sure that the front edge of the load plate slides under the shoulder screw cap as you lower the lever. Latch the socket lever under the load plate tab (Figure 8, C, and D). The socket cover (Figure 8, B) will pop off as shown.

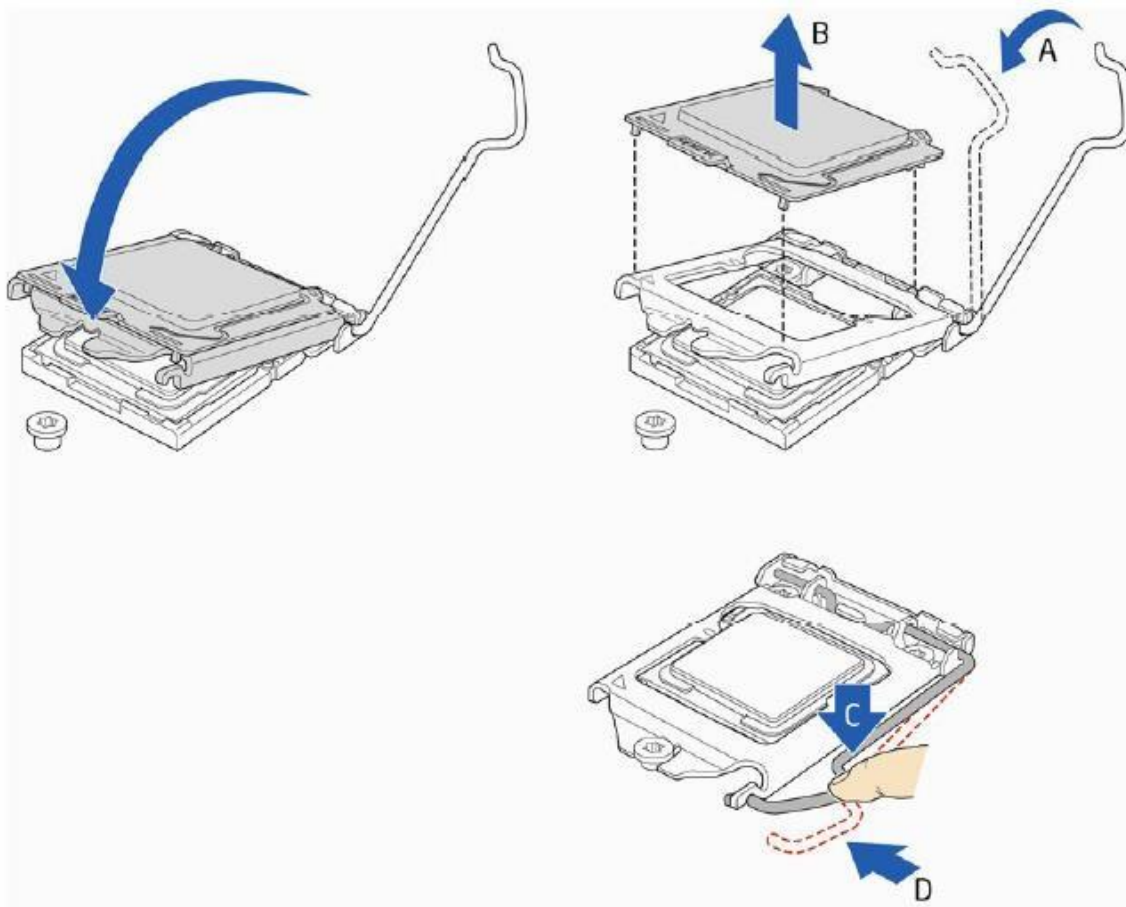


Figure 8: Secure the load plate in place

Pick up the socket cover and remove it from the desktop board.

3.3 Connecting the Processor Fan Heat Sink Cable

Connect the processor fan heat sink power cable to the 4-pin processor fan header (see Figure 9). A fan with a 4-pin connector as shown in Figure 9 advised.

1. Make sure the four hooks are in the proper position before you install the cooler.

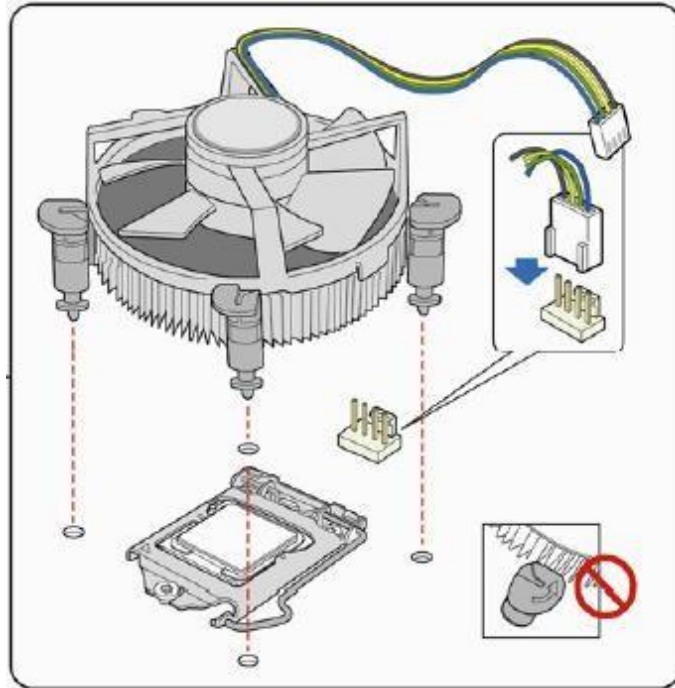


Figure 9: Connecting the processor fan

3.4 Installing & Removing Memory Modules

Installing Memory

You may install 2GB, 4GB, 8GB and 16GB un-buffered non-ECC DDR4 DIMMs into the DIMM sockets.

The motherboard has four DIMM sockets. The motherboard supports the following memory features:

2x DDR4 DIMMs

Non-ECC (64-bit) memory.

2GB, 4GB, 8GB and 16GB modules.

Memory Speeds 2133/2400MHz

Max. 64GB, DDR4

- To install DIMMs, follow these steps:
- Observe the precautions in “Before You Begin”.
- Turn off the computer and all Peripheral devices.
- Remove the computer cover and locate the DIMM sockets.
- Holding the DIMM by the edges, remove it from its antistatic package.
- Make sure the clips at either end of the socket are, clipped from the socket.
- Position the DIMM above the socket. Align the two small notches in the bottom edge of the DIMM with the keys in the socket. Insert the bottom edge of the DIMM into the socket.
- When the DIMM is seated push down on the top edge of the DIMM until the retaining clips at the ends of the socket snap into place. Make sure the clips are firmly in place.
- Replace the computer cover.

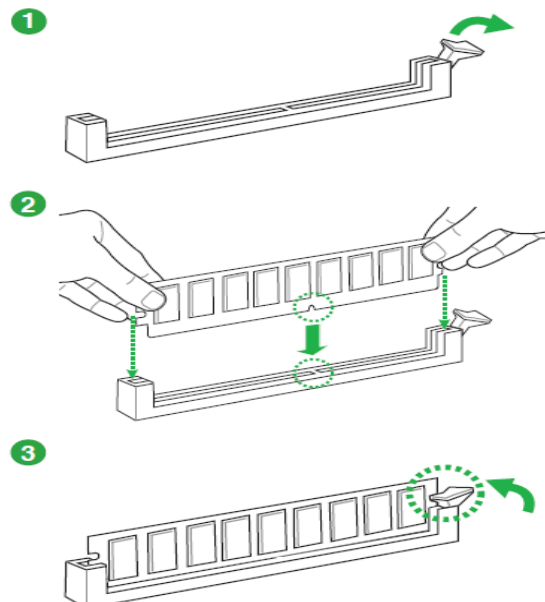
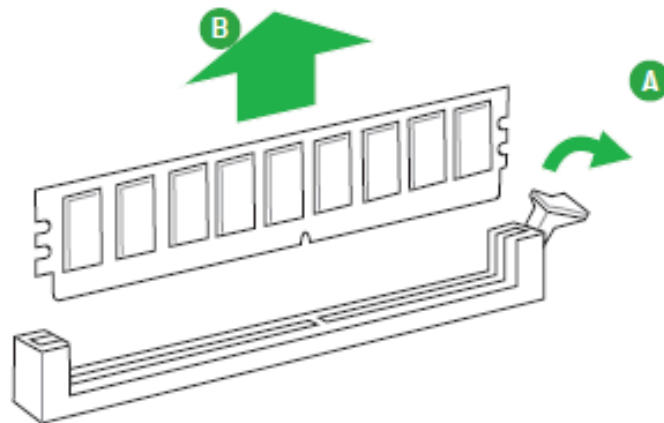


Figure 10: Memory Installation

3.5 Removing Memory

To remove a DIMM, follow these steps:

- Observe the precautions in "Before You Begin".
- Turn off all peripheral devices connected to the computer. Turn off the computer.
- Remove the computer cover.
- Gently spread the retaining clips at each end of the socket. The DIMM pops out of the socket. Hold the DIMM by the edges, lift it away from the socket, and store it in an antistatic package.
- Reinstall and reconnect any parts you removed or disconnected to reach the DIMM sockets.



3.6 PCI Express 3.0/2.0 x16 slots

The PCI Express slot supports the PCI Express interface expansion card. The PCI Express x16 slot supports up to 4.0 GB/s transfer rate.

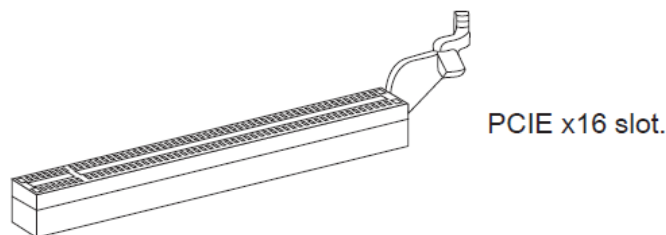


Figure 12: PCI Express Slot

Note: When adding or removing expansion cards, make sure that you power off the system first.

Important: When adding or removing expansion cards, always turn off the power supply and unplug the power supplies, power cable from the power outlet. Read the expansion card's documentation to check for any necessary additional hardware or software changes.

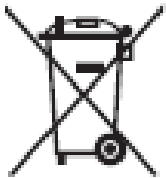
3.6 Replacing the CMOS Battery

Replacing the CMOS RAM Battery

A lithium battery is, installed in the socket on the system board.

The battery has an estimated life expectancy of seven years. When the battery starts to weaken, it loses voltage; when the voltage drops below a certain level, the system settings stored in CMOS RAM (for example, the date and time) may be wrong.

If the battery fails, you will need to replace it with a **CR2032** battery or an equivalent. As long as local ordinance permits, you may dispose of individual batteries as normal rubbish. Do not expose batteries to excessive heat or any naked flame. Keep all batteries away from children.



This symbol on the product or on its packaging indicates that the product should not be disposed of as household waste; it should be handed over to the applicable collection point for recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. The recycling of materials will help to conserve natural resources. For more detailed information about recycling of this product, please contact your local city office, your household waste disposal service or XMA Ltd.

CAUTION!

Danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by Viglen. Discard used batteries according to manufacturer's instructions and local regulations for disposal of electronic products.

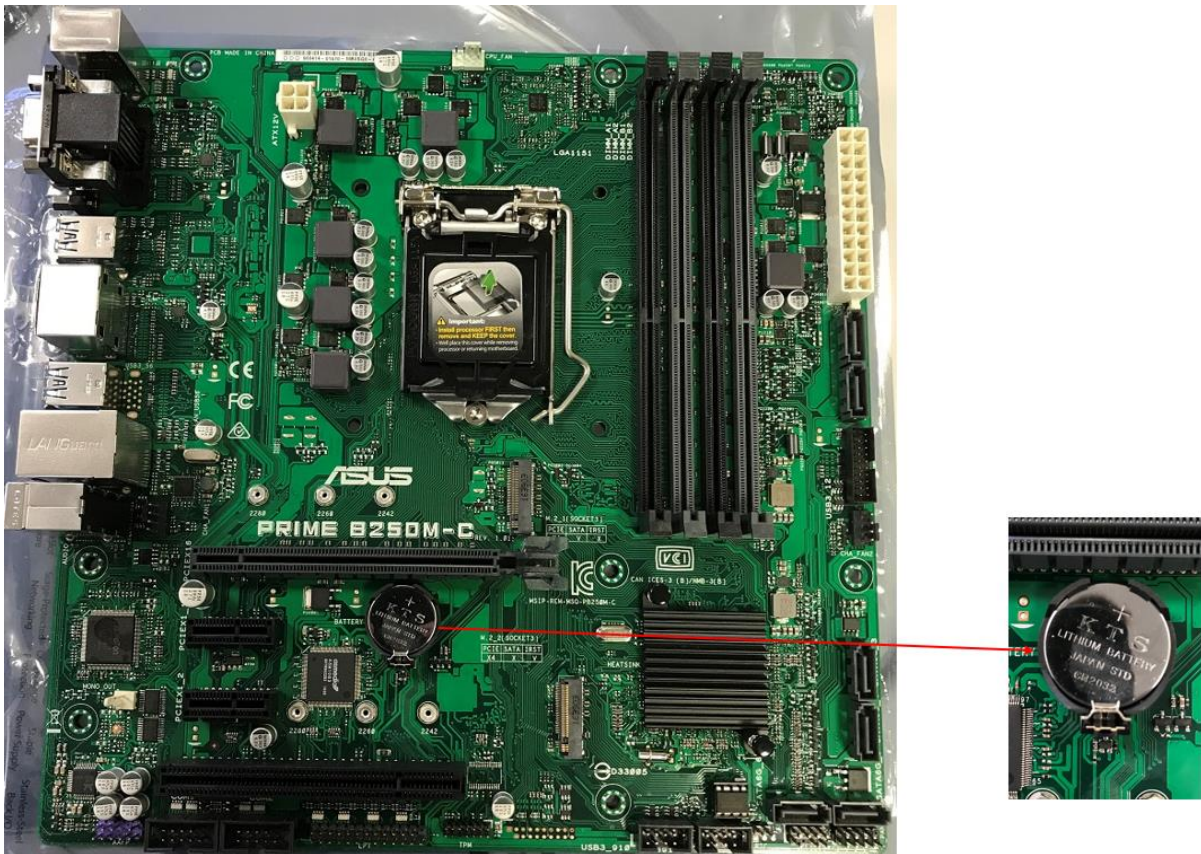


Figure 3.6.1 – Motherboard CMOS Battery

To replace the battery, carry out the following:

1. Turn off all peripheral devices connected to the system.
2. Turn off the system.
3. Remove any components that are blocking access to the battery.
4. Figure 33 shows the battery location. Gently pry the battery free from its socket using flat screwdriver, taking care to note the "+" and "-" orientation of the battery (Figure 30, 2).
5. Install the new battery in the socket.

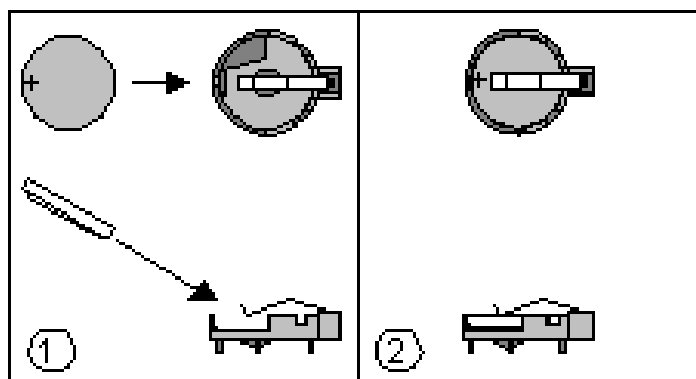


Figure 33: Removing the Battery

Recycling/Takeback Services

XMA recycling and takeback programs come from our commitment to the highest

standards for protecting our environment. We believe in providing solutions for you to be able to responsibly recycle our products, batteries, other components as well as the packaging materials. Please visit XMA web site for detail on recycling or contact your account manager.

Chapter 4 - Solving Problems

4.1 Technical Support

Technical Support contact details

The first part of this chapter helps you identify and solve problems that might occur when the system is in use. The second part lists error code messages that might be displayed.

Please remember that if you cannot solve the problem by yourself then you should contact XMA Technical Support for further assistance.

XMA Technical Support can be reached in the following ways: Telephone: 01727 201 850

Fax: 01727 201 858

Email: technical-support@xma.co.uk

You can also look for support information on our web site: <http://www.xma.co.uk/>

Device drivers and various useful utilities can be downloaded from our ftp site:

<http://download.viglen.co.uk/files/Motherboards/Vig770s>

Resetting the System

Before checking your system for hardware problems, it is always a good idea to try resetting your computer and see if a re-boot can solve the problem. Most software related problems can be solved simply by re-booting your PC.

To do the following	Press
Soft boot: Clear the system memory and reload the operating system (also called warm reset).	<Ctrl + Alt + Del>
Cold boot: Clear the system memory, halt power to all peripherals, restart POST, and reload the operating system.	Power off/on or reset button (at front of the system)

4.2 Troubleshooting Procedures

This section provides instructions to troubleshooting procedure to identify a problem and locate its source.

CAUTION!

Turn off the system and any peripheral devices before you disconnect any peripheral cables from the system. Otherwise, you can permanently damage the system or the peripheral devices.

Plug the system properly into grounded power outlet.

Make sure your keyboard and video display is connected correctly to the system. Turn on the video display, and turn up its brightness and contrast controls to at least two-thirds of the maximum (refer to the documentation supplied with the video display).

If the operating system normally loads from the hard disk drive, make sure there is no diskette in the diskette drive. If the operating system normally loads from a diskette, insert the operating system diskette into the drive.

Turn on the system. If the power indicator does not light, but the system seems to be operating normally, the indicator is probably defective. Monitor the power-on self-test (POST) execution. Each time you turn on the system, the POST checks the system board, memory, keyboard, and certain peripheral devices.

NOTE: *If the POST does not detect any errors, the system beeps once and boots up.*

Errors that do not prevent the boot process (non-fatal errors) display a message that looks similar to the following:

Error Message Line 1 Error Message Line 2

Press for Set-up, <F1> to Boot

You can note the error and press <F1> to resume the boot-up process, or to enter Set-up.

Errors that prevent the boot process from continuing (fatal errors), are communicated by a series of audible beeps. If this type of error occurs, refer to the error codes and messages listed at the end of this chapter.

Confirm that the operating system has loaded.

4.3 Problems & Suggestions

What happens	What to do
Application software problems	<p>Try resetting the system.</p> <p>Make sure all cables are installed correctly.</p> <p>Verify that the system board jumpers are set properly.</p> <p>Verify that your system hardware configuration is set correctly. In Setup, check the values against the system settings you recorded previously. If an error is evident, (wrong type of drive specified, for example), make the change in Setup and reboot the system. Record your change.</p> <p>Make sure the software is properly configured for the system. Refer to the software documentation for information.</p> <p>Try a different copy of the software to see if the problem is with the copy you are using.</p> <p>If other software runs correctly on the system, contact the vendor of the software that fails.</p> <p>If you check all of the above with no success, try clearing CMOS RAM and reconfiguring the system. Make sure you have your list of system settings available to re-enter, because clearing CMOS RAM sets the options to their default values.</p>
Characters on- screen are distorted or incorrect	<p>Make sure the brightness and contrast controls are properly adjusted on the monitor.</p> <p>Make sure the video signal cable and power cables are properly installed.</p> <p>Make sure your monitor is compatible with the video mode you have selected.</p>
Characters do not appear on screen	<p>Make sure the video display is plugged in and turned on.</p> <p>Check that the brightness and contrast controls are properly adjusted.</p> <p>Check that the video signal cable is properly installed.</p> <p>Make sure a video board is installed, enabled, and the jumpers are positioned correctly.</p> <p>Reboot the system.</p>

Table 6: Problems and Suggestions

Table 8: Problems and Suggestions (Continued)	
What happens	What to do
CMOS RAM settings are wrong	If system settings stored in CMOS RAM change for no apparent reason (for example, the time of day develops an error), the backup battery may no longer have enough power to maintain the settings. Replace the battery (Chapter 2).
Diskette drive light does not go on when drive is in use or is tested by POST	Make sure the power and signal cables for the drive are properly installed. Check that the drive is properly configured and enabled in Setup.
Hard drive light does not go on when drive is in use or is tested by POST	Make sure the power and signal cables for the drive are properly installed. Make sure the front panel connector is securely attached to the system board headers. Check that the drive is properly configured and enabled in Setup. Check the drive manufacturer's manual for proper configuration for remote hard disk drive activity.
Power-on light does not go on	If the system is operating normally, check the connector between the system board and the front panel. If OK, the light may be defective.
Prompt doesn't appear after system boots	It's probably switched off. A serious fault may have occurred consult your dealer service department / Technical Support.
Setup, can't enter	If you can't enter Setup to make changes, check the switch that disables entry into Setup (Chapter 2). If the switch is set to allow entry into Setup, you might need to clear CMOS RAM to the default values and reconfigure the system in Setup.
System halts before completing POST	This indicates a fatal system error that requires immediate service attention. Note the screen display and write down any beep code emitted. Provide this information to your dealer service department / Technical Support.

Table 8: Problems and Suggestions Continued

Chapter 5 - System BIOS

5.1 What is the BIOS?

The BIOS (Basic Input Output System) is an important piece of software which is stored in a ROM (Read Only Memory) chip inside the computer. It consists of the basic instructions for controlling the disk drives, hard disk, keyboard and serial/parallel ports. The BIOS also keeps a list of the specifications of the computer in battery-backed RAM (also known as the CMOS RAM) and provides a special Setup program to change this information.

The BIOS in your Viglen computer is guaranteed to be fully compatible with the IBM BIOS. American Megatrends Inc, an industrial leader in the field of BIOS software, has written it.

5.2 The Power-On sequence

When the computer is first switched on, certain instructions in the BIOS are executed to test various parts of the machine. This is known as the POST (Power-On Self-Test) routine. When you switch the computer on (or when you press the Reset button or press <Ctrl> + <Alt>+ <Delete> keys, which has the same effect), you can see on the monitor that it counts through the memory, testing it. The floppy disk drives are then accessed and tested, and the various interfaces are checked. If there are any errors, a message is displayed on the screen.

5.3 Managing and updating BIOS

5.3.1 Introduction

Updating BIOS to the latest Viglen approved version is recommended. The number of options made available for any particular board may vary depending on BIOS Support, drive support and BIOS update file size. You only use.

- **ASUS Tek. EzFlash Utility**
- **BIOS Updater (DOS)**

Latest BIOS files and Utility are available from Viglen FTP site:

NOTE: Please review the instructions distributed with the upgrade utility before attempting a BIOS upgrade.

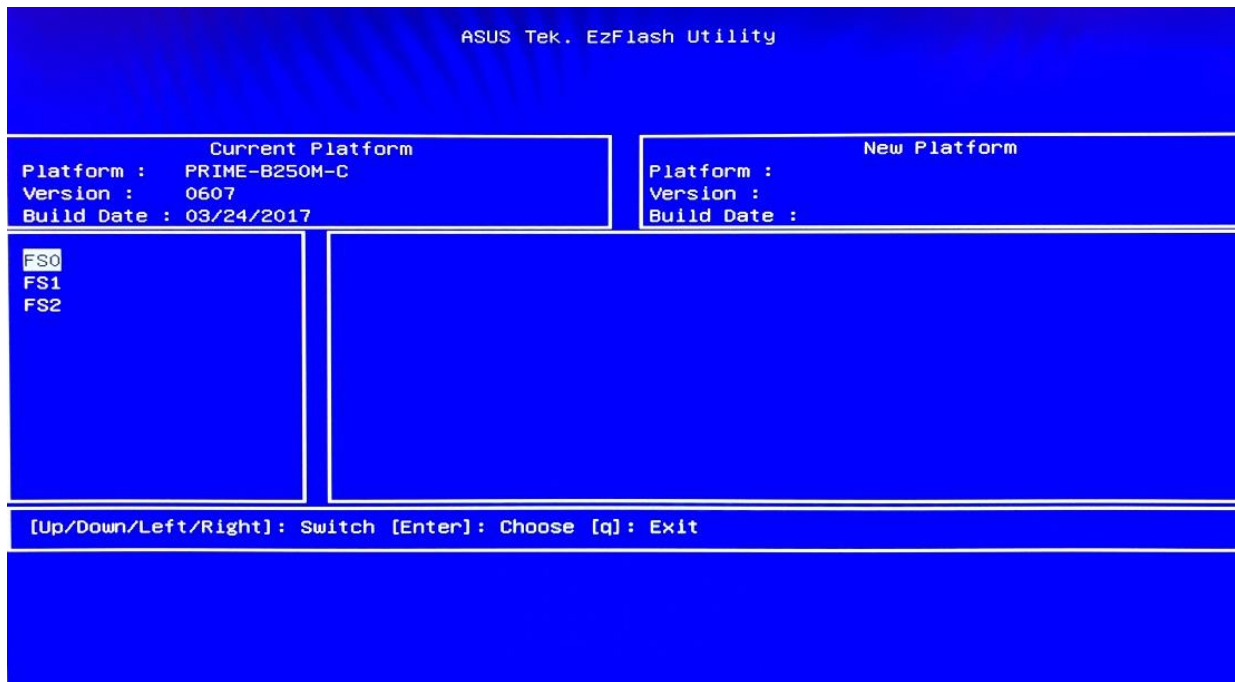
5.3.2 BIOS Update Instructions under DOS

The BIOS Updater allows you to update BIOS in a DOS environment. This utility also allows you to copy the current BIOS file that you can use as a backup when the BIOS fails or gets corrupted during the updating process.

- Save BIOS update zipped file to a temporary directory.
- Extract the necessary files.
- Copy the contents of the file to a bootable USB key or CD-ROM media.
- Boot the target PC with the device connected or inserted.
- Select **<F8>** during POST to display the Boot Menu and select your bootable device.
- At the DOS prompt Type 'Flash.bat' to launch the BIOS updates process.
- Reboot the system once complete.
- Enter the BIOS Setup and Ensure to load the BIOS default settings to ensure system compatibility and stability. Select the Load Optimized Defaults item under the Exit menu.

IMPORTANT: DO NOT shutdown or reset the system while updating the BIOS!
Doing so may cause system boot failure!

5.3.3 BIOS Update Instructions using ASUS Tek. EzFlash Utility



- For this method you will require a Flash USB device and required BIOS file.
- Insert the USB flash disk that contains the latest BIOS file to the USB port.
- During POST press <ALT> + <F2> to enter the ASUS Tek. EzFlash Utility
- Navigate through the EzFlash Utility using the arrows keys
- Press the Up/Down arrow keys to find the USB flash disk that contains the latest BIOS, and then press <Enter>.
- Press the Up/Down arrow keys to find the BIOS file, and then press <Enter> to perform the BIOS update process. Reboot the system when the update process is done.

Note:

This function supports USB flash disks formatted using FAT32/16 on a single partition only.

Ensure to load the BIOS default settings to ensure system compatibility and stability. Select the Load Optimized Defaults item under the Exit menu.

IMPORTANT!

During the update process DO NOT shut down the PC or interrupt the process, this could cause damage to the motherboard.

5.4 BIOS Setup Program

This chapter provides basic information on the BIOS Setup program and allows you to configure the system for optimum use. You may need to run the Setup program when:

An error message appears on the screen during the system booting up, and requests you to run BIOS SETUP.

You want to change the default settings for customized features.

Note: *The items under each BIOS category described in this chapter are under continuous update for better system performance.*

Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.

5.4.1 Entering BIOS Setup

Power on the computer and the system will start POST (Power On Self-Test) process. When the message below appears on the screen, press <F2> or key to enter Setup. You can also press <F8> when the message below is on screen to bring up the Boot Menu.

“Press or <F2> to enter BIOS setup Menu”

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

Control Keys

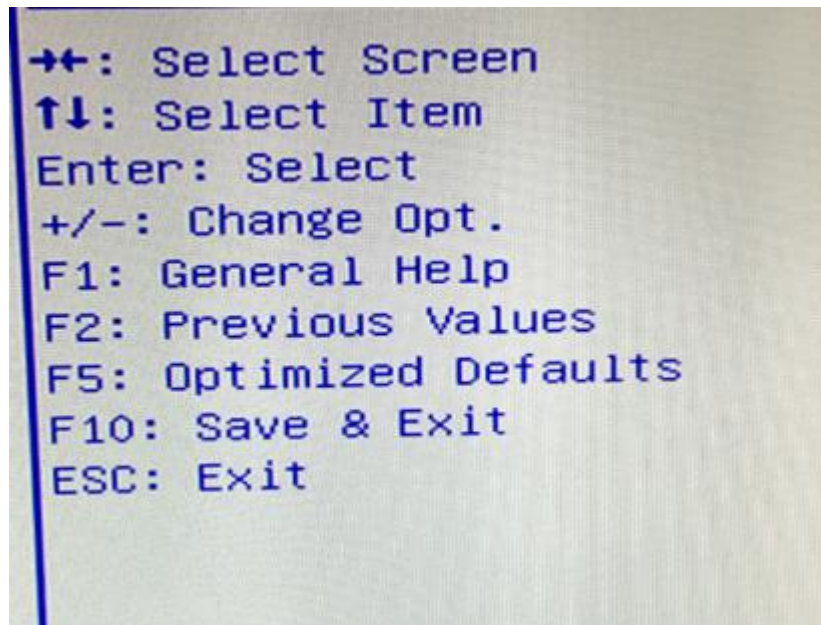


Figure 13: BIOS control keys

After entering the BIOS, the first screen you will see is the Main Menu

5.4.2 BIOS menu screen

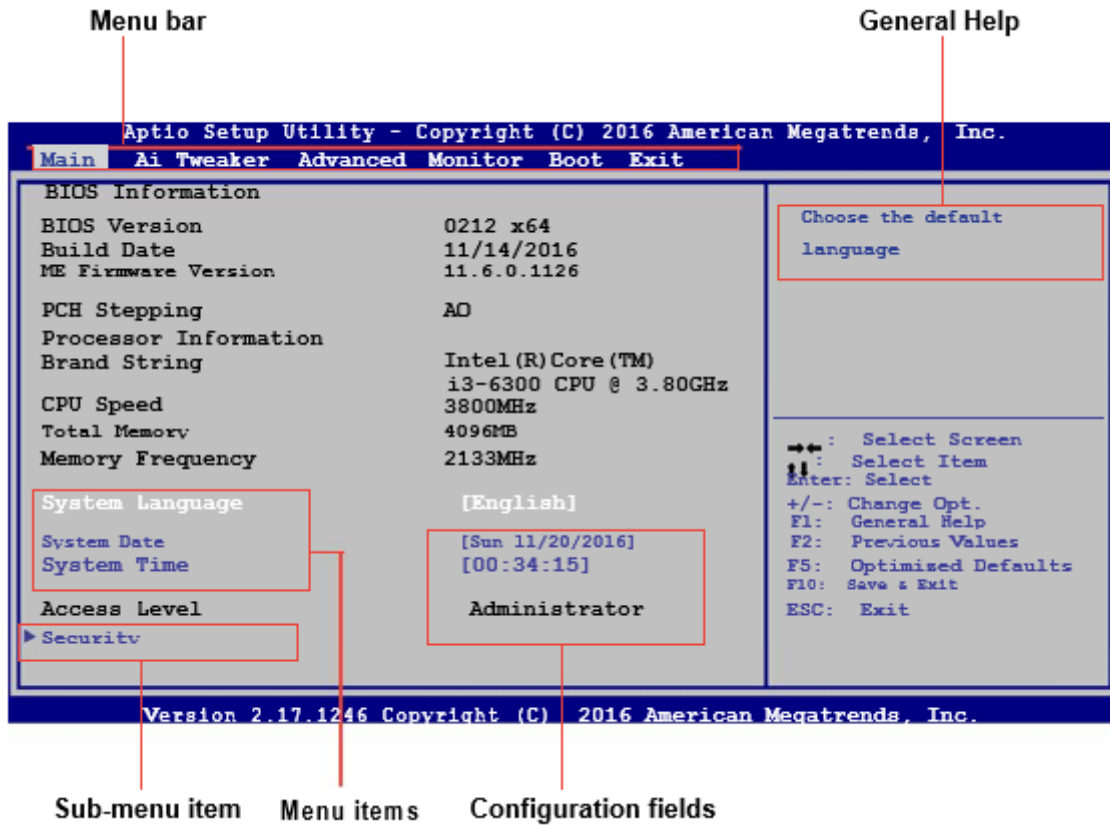


Figure 14: Bios Menu

The boot device options vary depending on the devices you installed to the system.

The **Boot Menu (F8)** button is available only when the boot device is installed to the system.

5.4.3 BIOS Main Menu selection

The menu bar on top of the screen has the following main items:

BIOS Main Menu	
Main	For changing the basic system configuration
Ai Tweaker	For changing the overclocking settings
Advanced	For changing the advanced system settings
Monitor	For displaying the system temperature, power status, and changing the fan settings
Boot	For changing the system boot configuration
Exit	For selecting the exit options and loading default settings

Menu items

The highlighted item on the menu bar displays the specific items for that menu. For example, selecting Main shows the Main menu items.

The other items (Ai Tweaker, Advanced, Monitor, Boot and Exit) on the menu bar have their respective menu items

5.4.4 Main menu

The Main menu screen appears when you enter the Advanced Mode of the BIOS Setup program. The Main menu provides you an overview of the basic system information, and allows you to set the system date, time, language, and security settings.

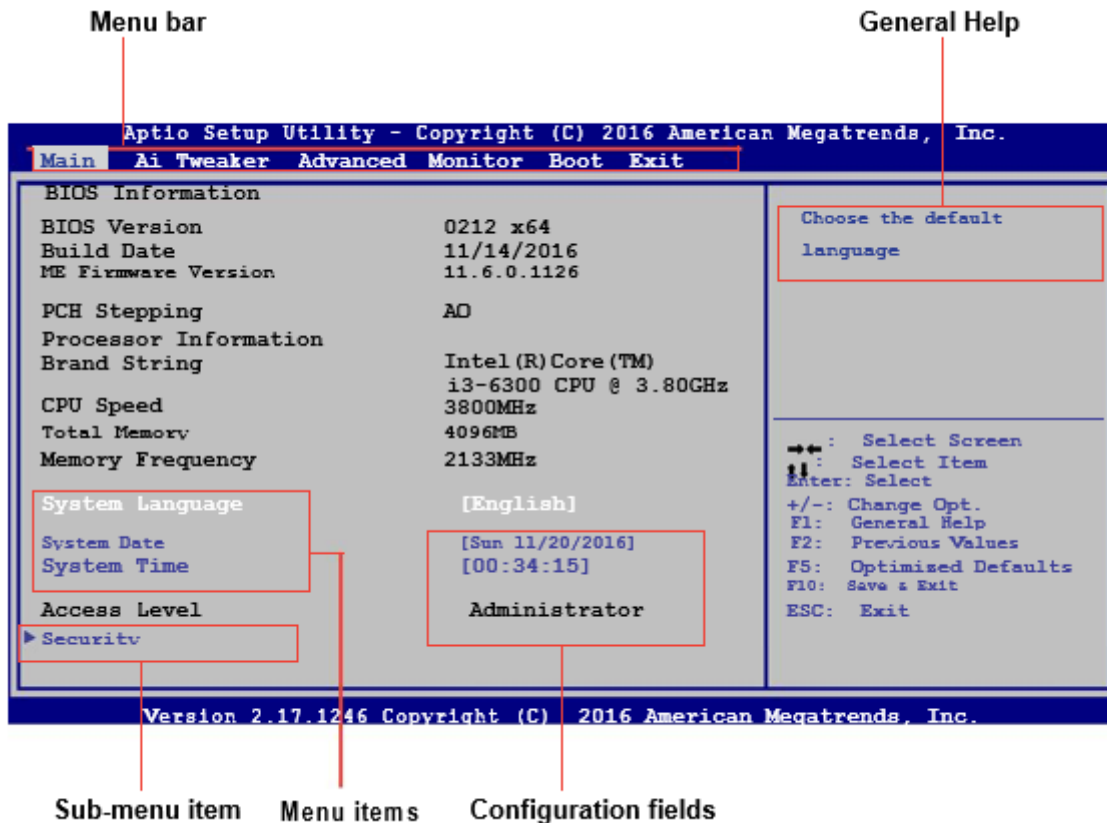


Figure 17: Main Menu

5.4.4.1 System Language [English]

Allows you to choose the BIOS language version from the options.

5.4.4.2 System Date [Day xx/xx/xxxx]

Allows you to set the system date.

5.4.4.3 System Time [xx:xx:xx]

Allows you to set the system time.

5.4.4.4 Security

The Security menu items allow you to change the system security settings.

If you have forgotten your BIOS password, erase the CMOS Real Time Clock (RTC) RAM to clear the BIOS password.

The **Administrator** or **User Password** items on top of the screen show the default **Not Installed**. After you set a password, these items show **Installed**.

Administrator Password

If you have set an administrator password, we recommend that you enter the administrator password for accessing the system. Otherwise, you might be able to see or change only selected fields in the BIOS setup program.

To set an administrator password:

Select the **Administrator Password** item and press <Enter>. From the **Create New Password** box, key in a password, then press <Enter>. Confirm the password when prompted.

To change an administrator password:

Select the **Administrator Password** item and press <Enter>. From the **Enter Current Password** box, key in the current password, then press <Enter>. From the **Create New Password** box, key in a new password, then press <Enter>. Confirm the password when prompted.

To clear the administrator password, follow the same steps as in changing an administrator password, but press <Enter> when prompted to create/confirm the password. After you clear the password, the **Administrator Password** item on top of the screen shows **Not Installed**.

User Password

If you have set a user password, you must enter the user password for accessing the system. The **User Password** item on top of the screen shows the default **Not Installed**. After you set a password, this item shows **Installed**.

To set a user password:

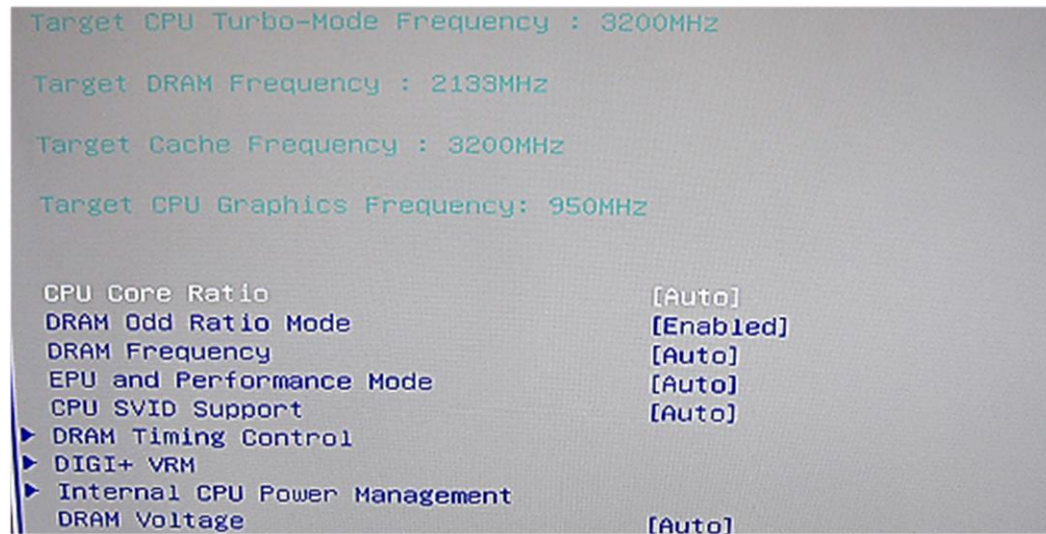
- Select the **User Password** item and press <Enter>.
- From the **Create New Password** box, key in a password, then press <Enter>.

Confirm the password when prompted.

- To change a user password:
- Select the **User Password** item and press <Enter>.
- From the **Enter Current Password** box, key in the current password, then press <Enter>.
- From the **Create New Password** box, key in a new password, then press <Enter>.
- Confirm the password when prompted.

To clear the user password, follow the same steps as in changing a user password, but press <Enter> when prompted to create/confirm the password. After you clear the password, the **User Password** item on top of the screen shows **Not Installed**.

5.4.5 Air Tweaker menu



The Ai Tweaker menu items allow you to configure overclocking-related items.

Be cautious when changing the settings of the Ai Tweaker menu items. Incorrect field values can cause the system to malfunction.

The configuration options for this section vary depending on the CPU and DIMM model installed on the motherboard.

Figure 18: Ai Tweaker Menu

5.5.5 Advanced Menu Screen

The Advanced menu items allow you to change the settings for the CPU and other system devices.

NOTE: Be cautious when changing the settings of the advanced menu items. Incorrect field values can cause the system to malfunction.

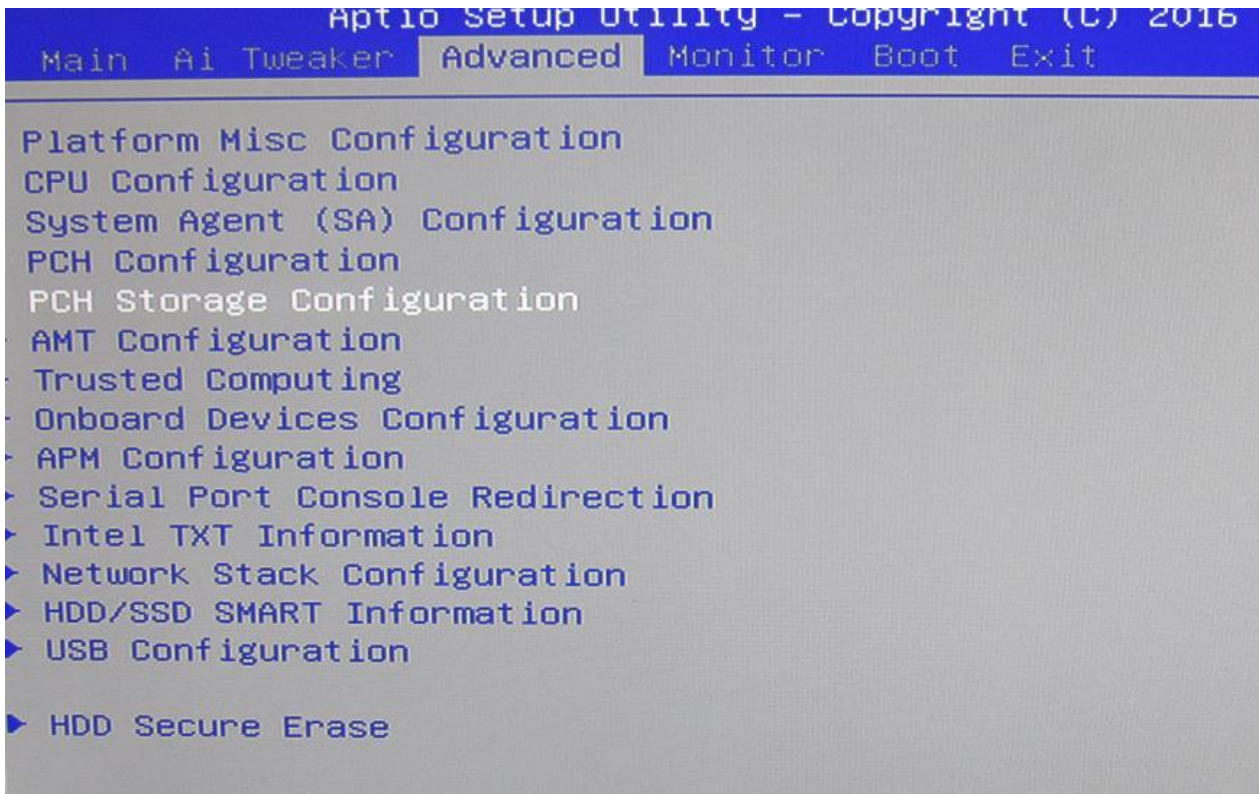
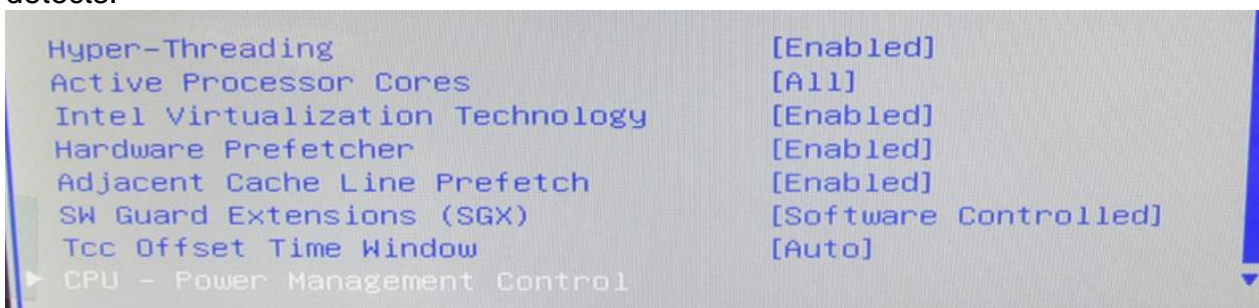


Figure 19: Advanced Sub Menu Screen

5.5.5.1 CPU Configuration

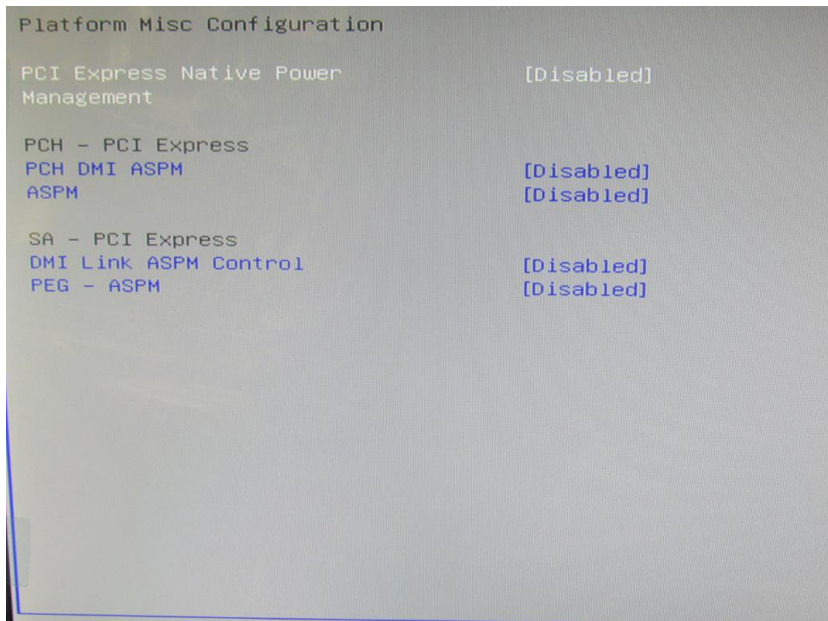
The items in this menu show the CPU-related information that the BIOS automatically detects.



The items shown in submenu may be different due to the CPU you installed.

5.5.5.2 Platform Misc Configuration

The items in this menu allow you to configure the platform-related features.



The items in this menu allow you to configure the platform-related features.

Figure 20: Platform Misc Configuration

5.5.5.3 System Agent (SA) Configuration

Allows you to set the SATA configuration.

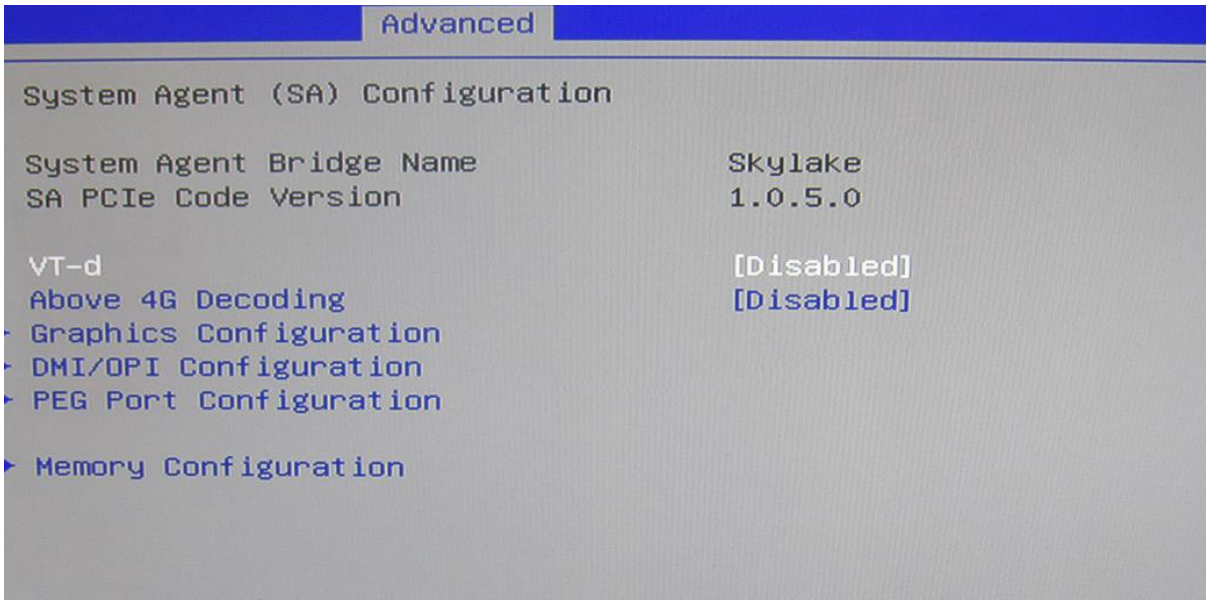


Figure 21: System Agent (SA) Configuration

5.5.5.4 PCH Configuration

While entering Setup, the BIOS automatically detects the presence of SATA devices. The SATA Port items show Not Present if no SATA device is installed to the corresponding SATA port

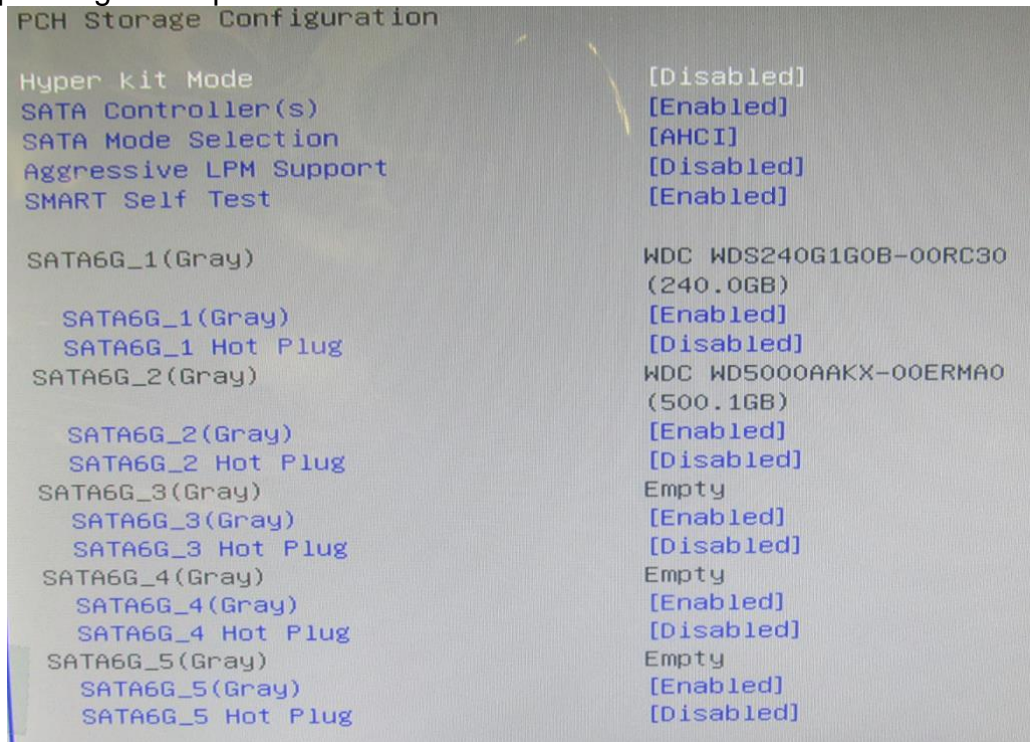


Figure 22: PCH Configuration

5.5.5.5 USB Configuration

The items in this menu allow you to change the USB-related features.

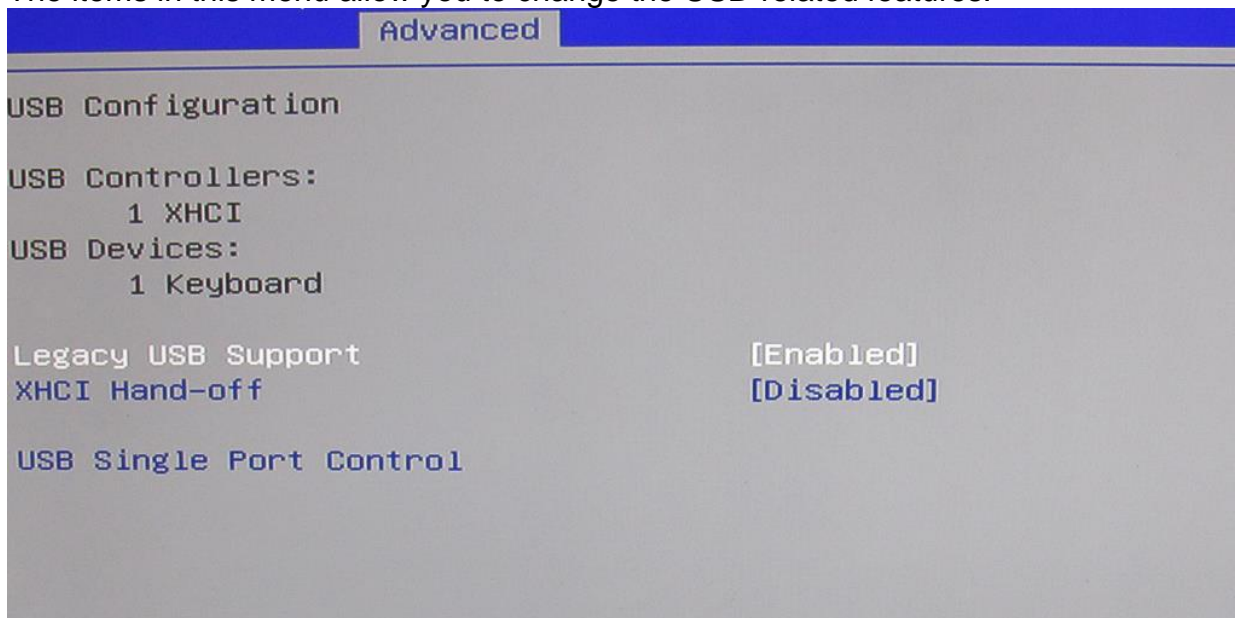


Figure 23: USB Configuration

5.5.5.6 On-board Devices Configuration

Configuration on board device such as audio and serial port configuration.

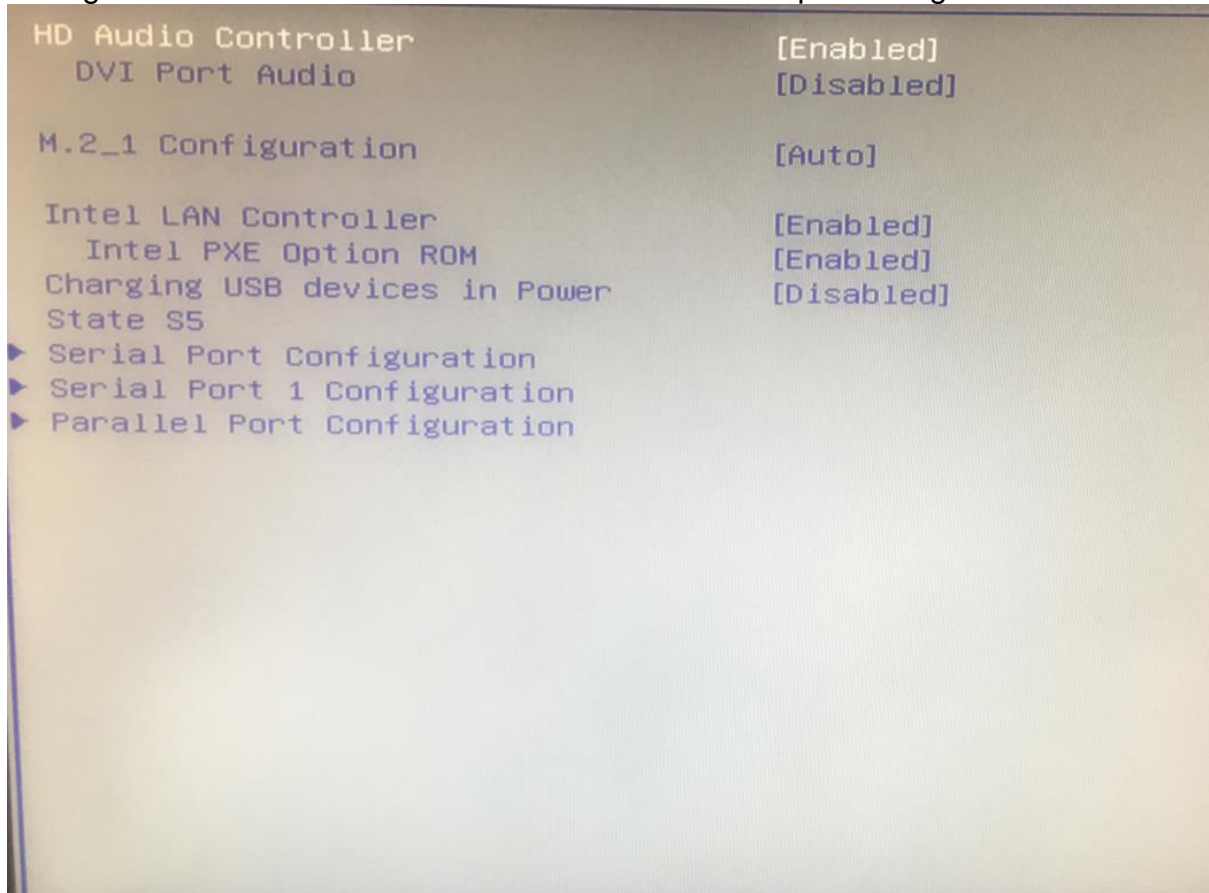


Figure 24: On-board Devices Configuration

5.5.5.7 APM Configuration

Advanced power management.

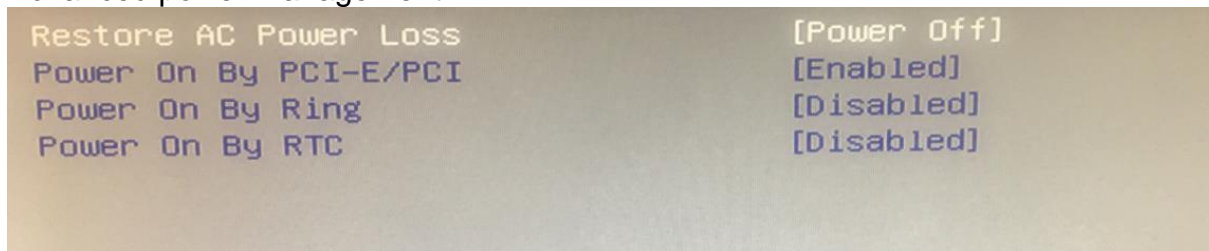


Figure 25: APM Configuration

5.5.5.8 Network Stack Configuration

This item allows user to disable or enable setting such as the UEFI network stack. Configuration options:

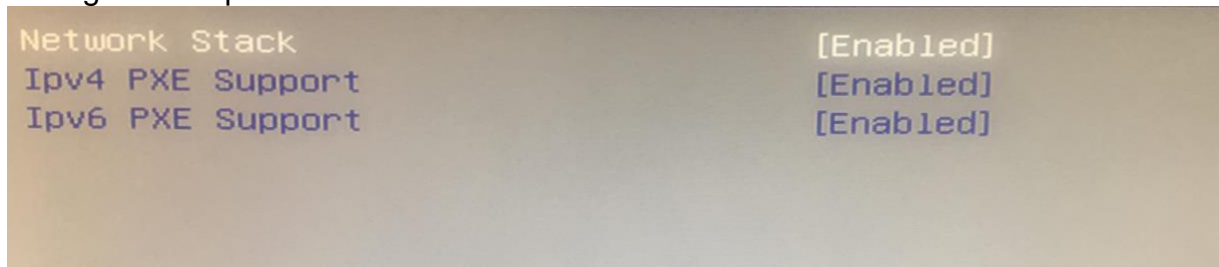
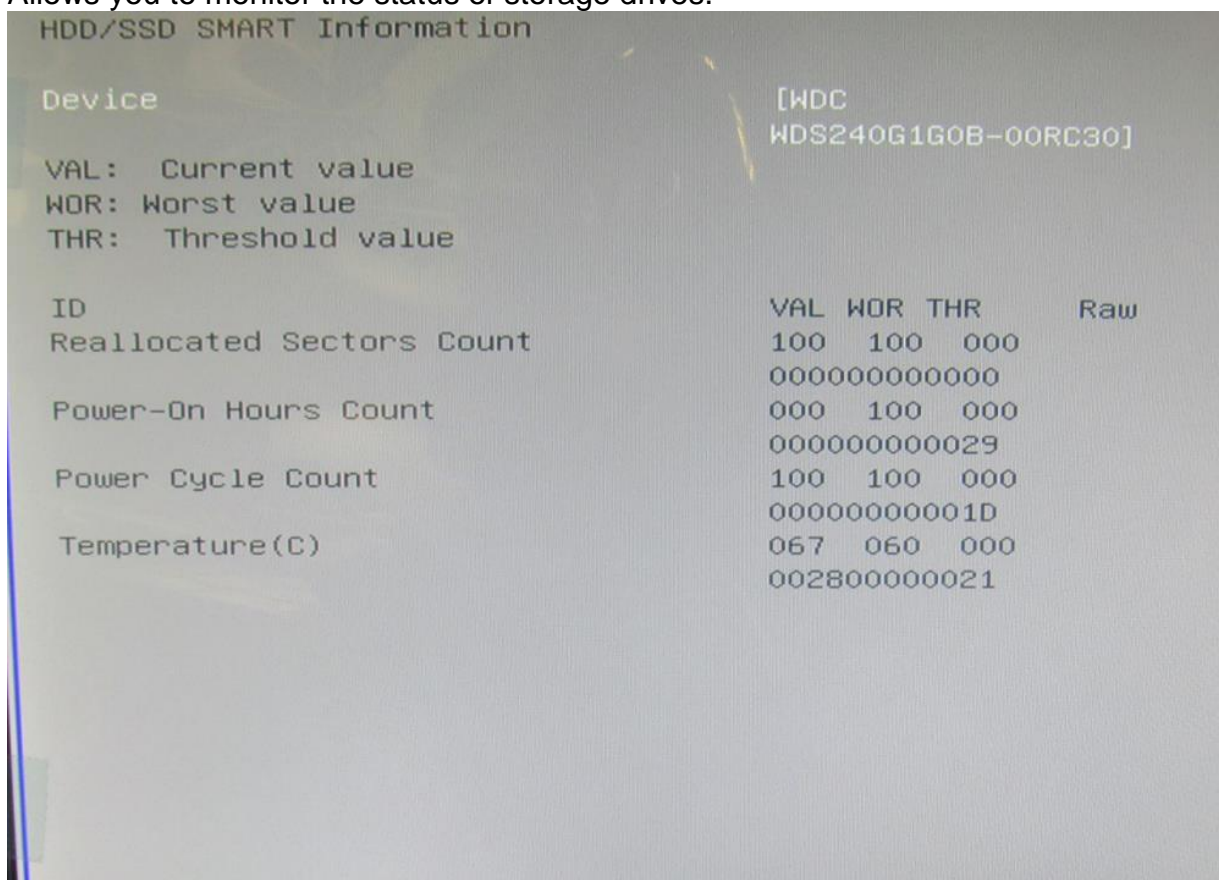


Figure 26: Network Stack Configuration

5.5.5.9 HDD/SSD SMART Information

Allows you to monitor the status of storage drives.



5.5.6 Monitor menu

The Monitor menu displays the system temperature/power status, and allows you to change the fan settings.

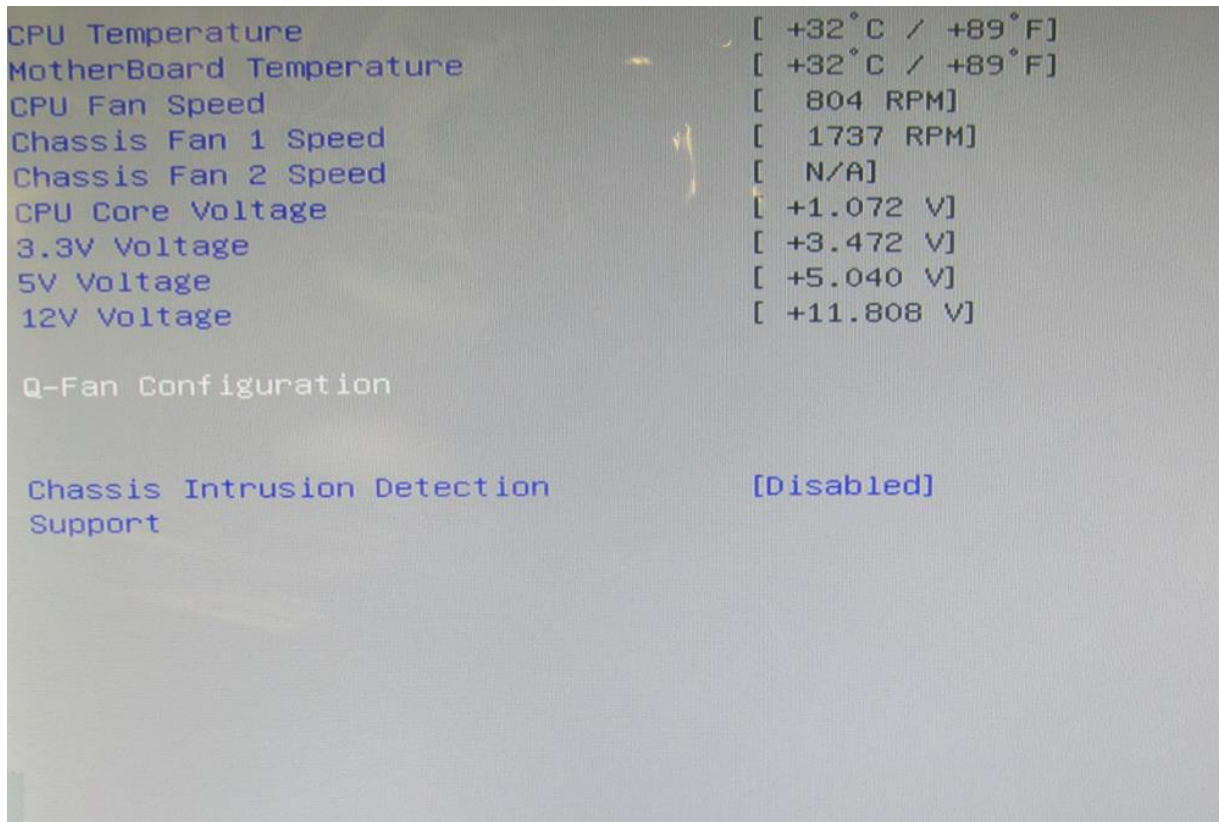


Figure 27: Monitor Menu

5.5.7 Boot menu

The Boot menu items allow you to change the system boot options.

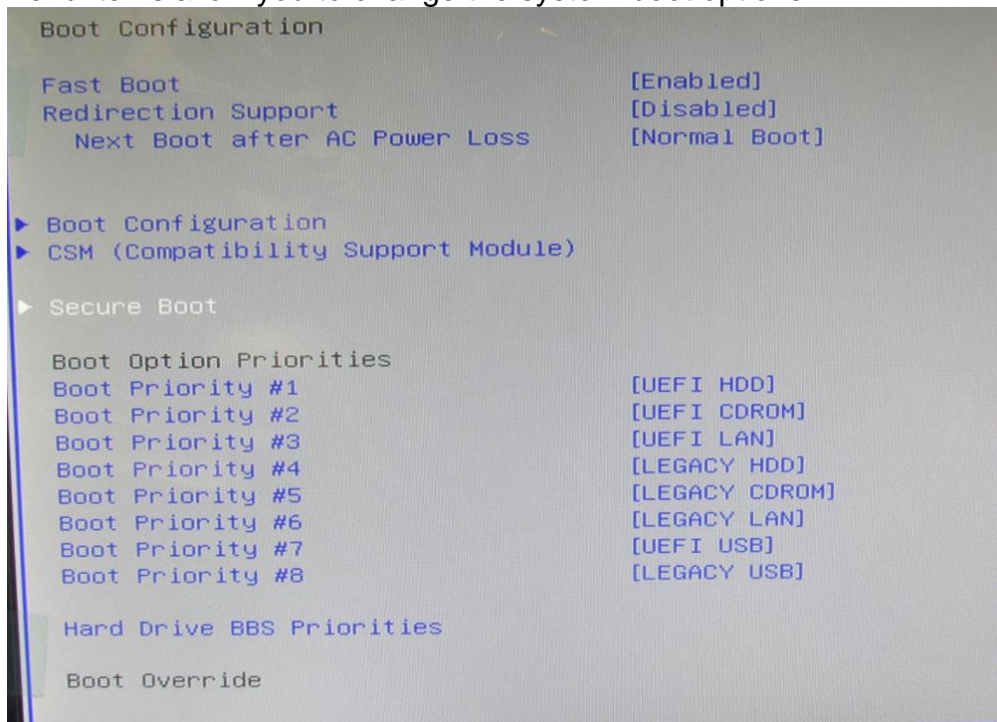


Figure 28: Boot Menu

BIOS settings for Windows 7 and Windows 10 O/S

Windows UEFI mode for Windows 10

Vig770S system configured with Windows 10 will have following default BIOS settings. If you wish to downgrade to Windows 7 (sixth gen Processors only) then BIOS must be configured to Non-UEFI mode.

Boot\CSM (Compatibility Support module)

Launch CSM	[Enabled]
Boot Device Control	[UEFI Only]
Boot from Network Devices	[UEFI drivers first]
Boot from Storage Devices	[UEFI drivers first]
Boot from PCI-E/PCI Expansion Devices	[UEFI drivers first]

Boot\Secure Boot Menu

OS Type [**Windows UEFI mode**]

Note

Please ensure the changes of the following settings are performed by personnel with some previous experience/knowledge of altering BIOS settings.

5.5.7.1 Enabling Windows UEFI mode for Windows 10 Operating System

1. From the BIOS main menu bar, select '**Advanced**'
2. Navigate to the **Boot** sub menu
3. Select **CSM (Compatibility Support Module)**

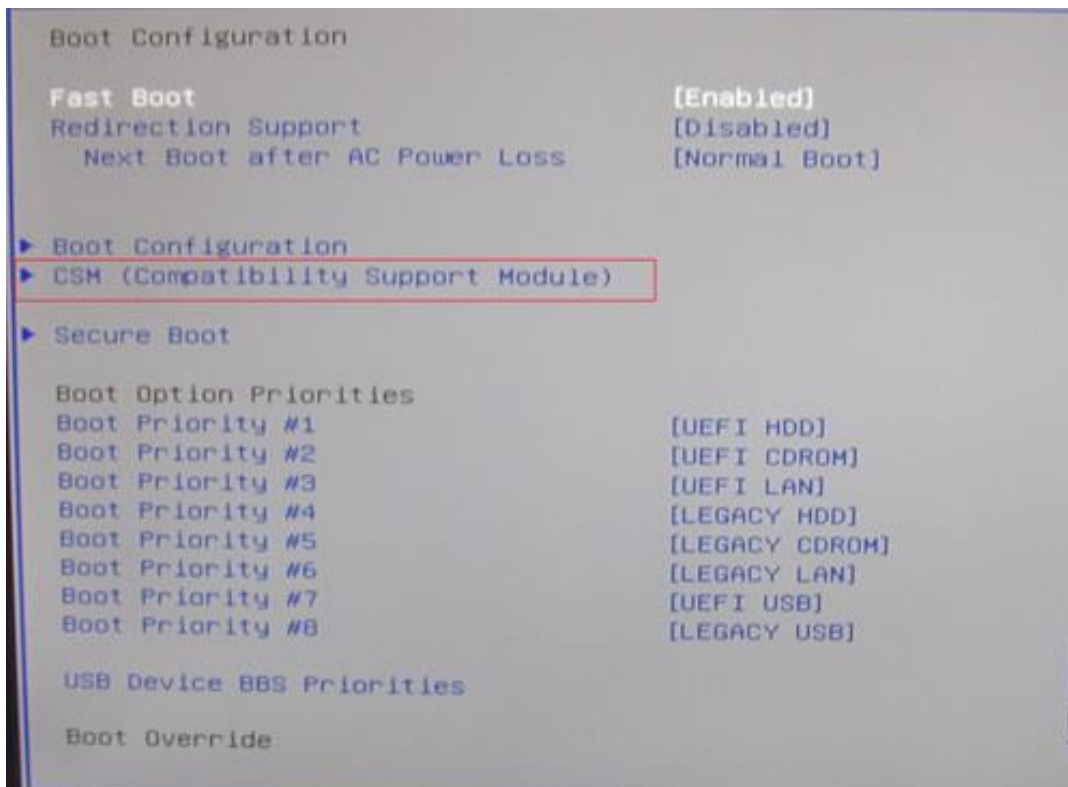


Figure 32: Boot Menu

4. In the CSM (**Compatibility Support Module**), change following settings for Windows 10.

Launch CSM	[Enabled]
Boot Device Control	[UEFI Only]
Boot from Network Devices	[UEFI drivers first]
Boot from Storage Devices	[UEFI drivers first]
Boot from PCI-E/PCI Expansion	[UEFI drivers first]

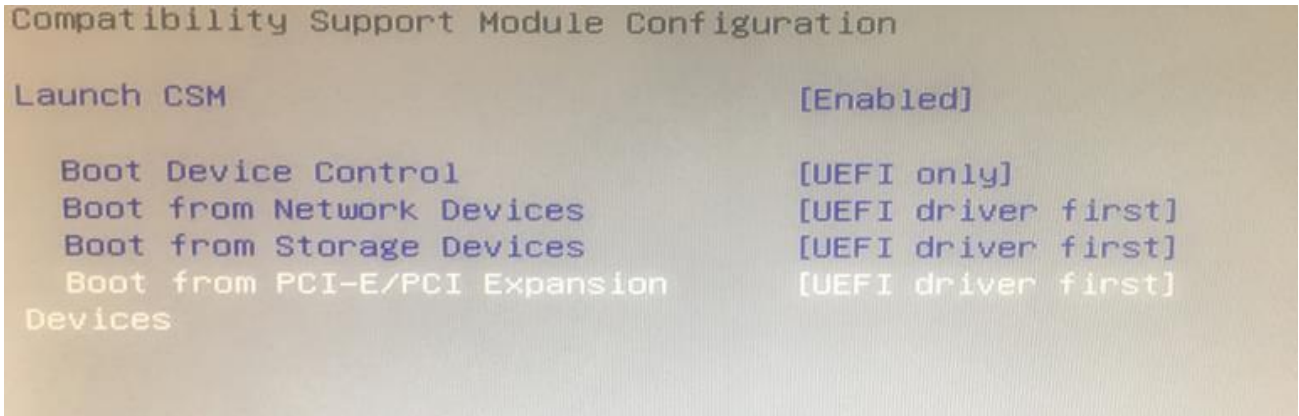


Figure 33: Compatibility Support Module

*Note: When these settings have been changed, press <Esc> or the Back Button to go back to the Boot Sub Menu to enable **Windows UEFI** for secure boot.*

5. Navigate to **Secure Boot** from within the Boot sub menu.

6. Change **OS Type** to **Windows UEFI**.

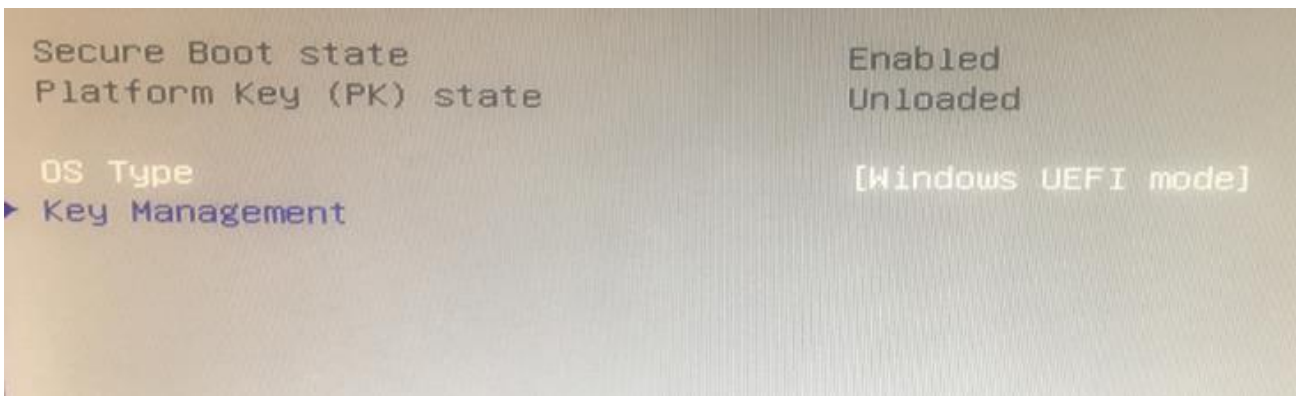


Figure 34: Secure Boot Menu

7. Select **Key Management**.

8. Select **Install default Secure Boot keys** and select **Yes** to proceed.

9. Press **F10** to Save and exit.

BIOS Settings for Windows 7 Operating System (Non-UEFI Mode)

To downgrade to Windows 7 operating system, BIOS settings must be changed to boot into Legacy BIOS mode (non UEFI Mode).

For Windows 7 operating system BIOS should be configured as per below settings

Boot\CSM (Compatibility Support module)

Launch CSM	[Enabled]
Boot Device Control	[UEFI and Legacy OPROM first]
Boot from Network Devices	[Legacy OPROM]
Boot from Storage Devices	[Legacy OPROM]
Boot from PCI-E/PCI Expansion Devices	[Legacy OPROM]

Boot\Secure Boot Menu

OS Type [Other OS]

5.5.8 Configuring Raid 1 in Bios Program

RAID 1 (Mirroring): A RAID 1 setup protects data from drive failure by simultaneously writing the same data to two hard drives. Since each drive is an exact duplicate of the other, you can continue working if one fails. RAID 1 offers no gain in performance and effectively reduces available capacity by half -- two 2TB drives provide only 2TB of storage.

To perform RAID configuration, you will need the following;

- Install two identical drives
- Change the SATA Mode Selection to “Intel RST Premium(RAID)” in the BIOS
- Create a RAID Volume
- Re-image the System.

Change the SATA Mode Selection to “Intel RST Premium (RAID)” in the BIOS

1. Access the bios by pressing the delete or F2 Key.
2. Navigate to the Advance taskbar and select “**PCH Storage Configuration**”

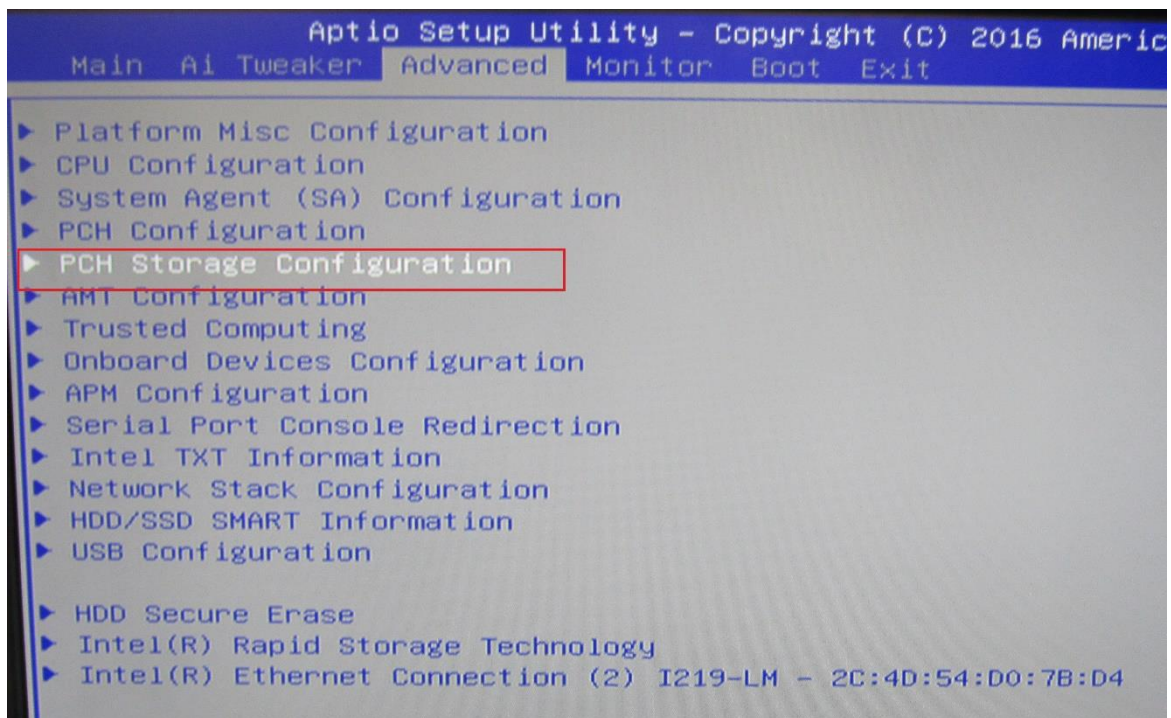


Figure 5.5.8.1

3. Navigate down to “**SATA Mode Selection**”
4. Select the “**Intel RST Premium (RAID)**” Option. Now the system has been selected to run in RAID Configuration.

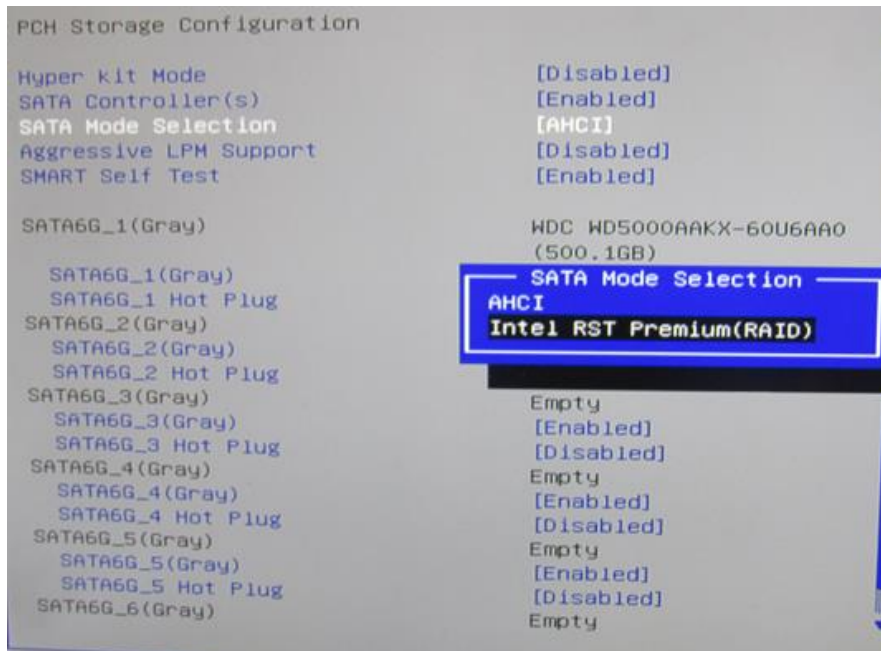


Figure 5.5.8.2

5. Press the F10 to Save and exit.

System will reboot, Press F2 to access the BIOS Setup.

6. Navigate down to select the “**Intel® Rapid Storage Technology**” in the advance taskbar.

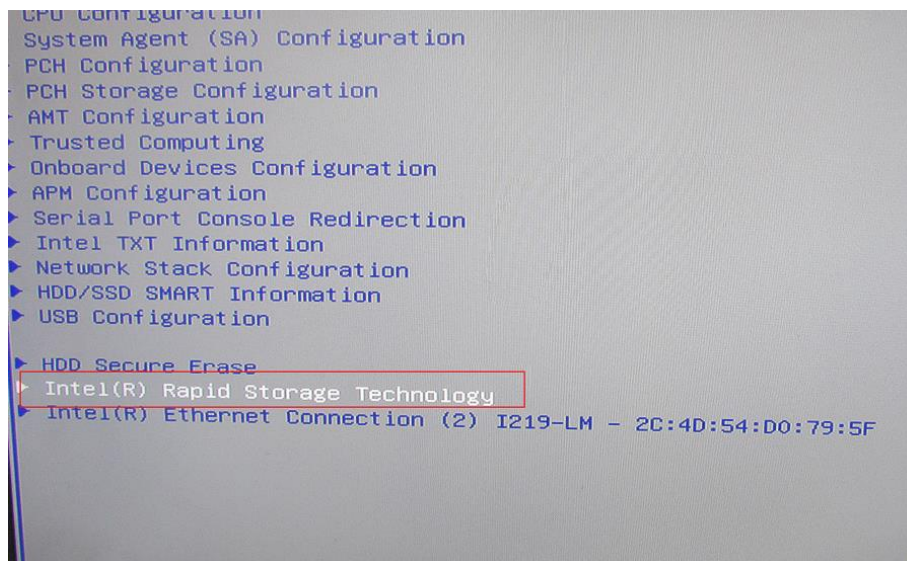


Figure 5.5.8.3

7. Now select **“Create RAID Volume”**.

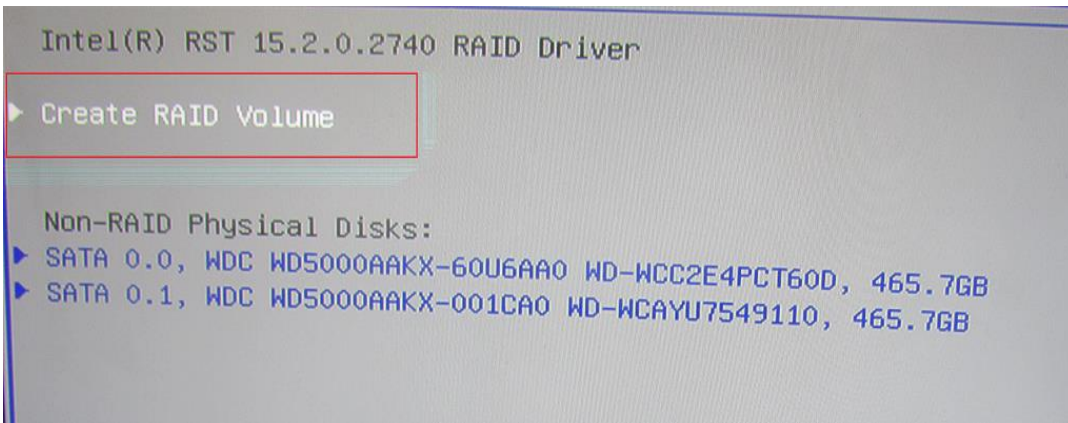


Figure 5.5.8.4

8. Now the system RAID configurations are set-up :

9. Change Name as preferred

10. Select the RAID Level (i.e. **“RAID1(Mirror)”**)

11. Tick the two hard drives installed in the system.

12. Select **“Create Volume”** and your done

13. **Press F10 to Save and Exit.**

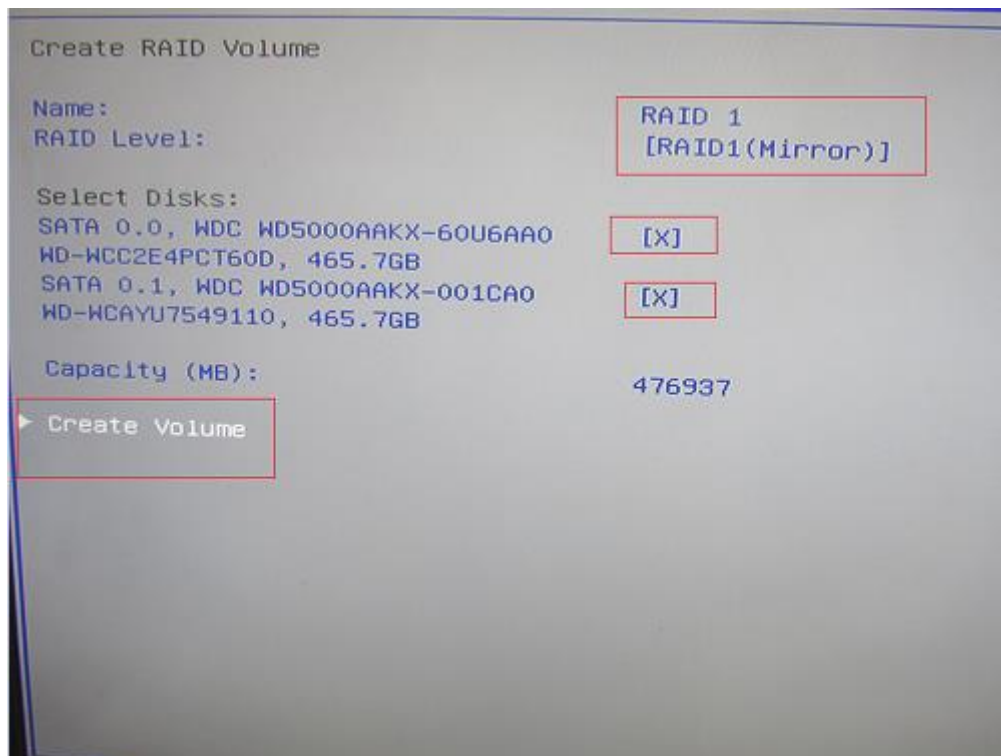


Figure 5.5.8.5

EU Declaration of Conformity

Motherboard CE certification

EU Declaration of Conformity



We, the undersigned,

Manufacturer:	ASUSTeK COMPUTER INC.
Address:	4F, No. 150, LI-TE Rd., PEITOU, TAIPEI 112, TAIWAN
Authorized representative in Europe:	ASUS COMPUTER GmbH
Address, City:	HARKORT STR. 21-23, 40880 RATINGEN
Country:	GERMANY

declare the following apparatus:

Product name :	Motherboard
Model name :	PRIME B250M-C

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

EMC – Directive 2004/108/EC (until April 19th, 2016) and Directive 2014/30/EU (from April 20th, 2016)

<input checked="" type="checkbox"/> EN 55022:2010+AC:2011	<input checked="" type="checkbox"/> EN 55024:2010
<input checked="" type="checkbox"/> EN 55032:2012+AC:2013	<input checked="" type="checkbox"/> EN 61000-3-3:2013
<input checked="" type="checkbox"/> EN 61000-3-2:2014	<input type="checkbox"/> EN 55020:2007+A11:2011
<input type="checkbox"/> EN 55013:2001+A1:2003+A2:2006	

R&TTE – Directive 1999/5/EC

<input type="checkbox"/> EN 300 328 V1.8.1(2012-06)	<input type="checkbox"/> EN 301 489-1 V1.9.2(2011-09)
<input type="checkbox"/> EN 300 440-1 V1.6.1(2010-08)	<input type="checkbox"/> EN 301 489-3 V1.6.1(2013-12)
<input type="checkbox"/> EN 300 440-2 V1.4.1(2010-08)	<input type="checkbox"/> EN 301 489-4 V2.1.1(2013-12)
<input type="checkbox"/> EN 301 511 V9.0.2(2003-03)	<input type="checkbox"/> EN 301 489-7 V1.3.1(2005-11)
<input type="checkbox"/> EN 301 908-1 V6.2.1(2013-04)	<input type="checkbox"/> EN 301 489-9 V1.4.1(2007-11)
<input type="checkbox"/> EN 301 908-2 V6.2.1(2013-10)	<input type="checkbox"/> EN 301 489-17 V2.2.1(2012-09)
<input type="checkbox"/> EN 301 908-13 V6.2.1(2014-02)	<input type="checkbox"/> EN 301 489-24 V1.5.1(2010-09)
<input type="checkbox"/> EN 301 893 V1.7.1(2012-06)	<input type="checkbox"/> EN 301 357-2 V1.4.1(2008-11)
<input type="checkbox"/> EN 300 330-2 V1.5.1(2010-02)	<input type="checkbox"/> EN 302 291-2 V1.1.1(2005-07)
<input type="checkbox"/> EN 50360:2001/A1:2012	<input type="checkbox"/> EN 302 623 V1.1.1(2009-01)
<input type="checkbox"/> EN 62479:2010	<input type="checkbox"/> EN 50566:2013/AC:2014
<input type="checkbox"/> EN 62311:2008	<input type="checkbox"/> EN 50385:2002

LVD – Directive 2006/95/EC (until April 19th, 2016) and Directive 2014/35/EU (from April 20th, 2016)

<input type="checkbox"/> EN 60950-1: 2006 / A12: 2011	<input type="checkbox"/> EN 60065:2002 / A12: 2011
<input checked="" type="checkbox"/> EN 60950-1: 2006 / A2: 2013	

Ecodesign – Directive 2009/125/EC

<input type="checkbox"/> Regulation (EC) No. 1275/2008	<input type="checkbox"/> Regulation (EC) No. 278/2009
<input type="checkbox"/> Regulation (EC) No. 642/2009	<input type="checkbox"/> Regulation (EU) No. 617/2013

RoHS – Directive 2011/65/EU

Ver. 160217

CE marking

Equipment Class 1



(EU conformity marking)

Signature	Taipei, Taiwan
Jerry Shen	Place of issue
Printed Name	3/11/2016
CEO	Date of issue
Position	2016
	Year CE marking was first affixed

Chapter 6

6.1 Suggestions

6.2 Questionnaire

XMA is interested in continuing to improve the quality and information provided in their manuals. XMA has listed some questions that you may like to answer and return to Viglen. This will help Viglen help to keep and improve the standard of their manuals.

Is the information provided in this and other manuals clear enough?

What could be added to the manual to improve it?

Does the manual go into enough detail?

Would you like an on-line version of this manual?

How do you rate the Viglen Technical support and Service Departments?

Are there any technological improvements that could be made to the system?

Other points you would like to mention?

Please return this slip to: Product Development Dept.
XMA Ltd.
7 Handley Page Way Colney Street
St Albans Hertfordshire AL2 2DQ

